# Boardmonitor/Controlunit 22 SY 405/23

Service
Service
**Service**

**For repair information of the tape deck see Service Manual SCA 4.4 (4822 725 23509)**

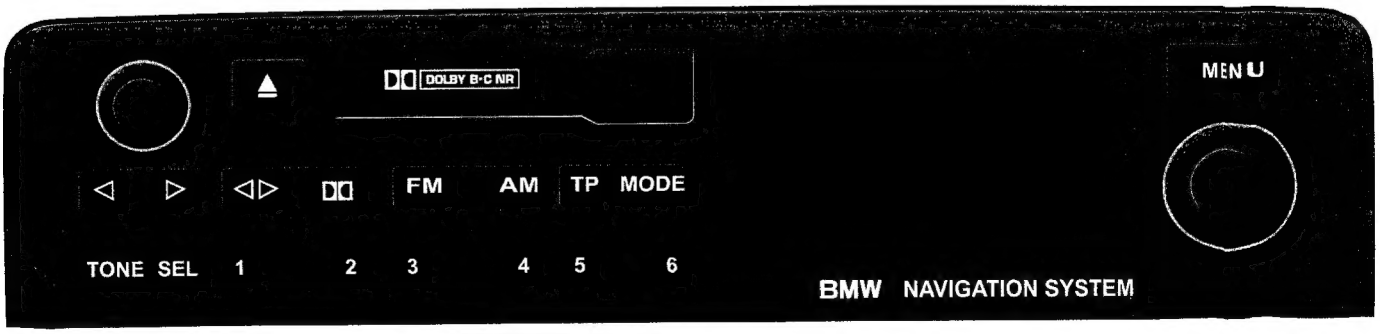
4703



**CONTENTS**

**12 V**



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PHILIPS

## GENERAL

The control- and display-unit 22SY405 is part of the BMW system E46. It controls (via K-Bus) the carradio modul 22DC785 (C23 BM), the navigation computer (22SY561) and the CD Changer (optional). Furthermore the system settings can be controlled and the board computer data of the car can be interrogated and displayed.

To get the 22SY405 into operation a minimum of system environment is necessary:
- Power supply (KL30, KL-R, KL58G, KL31)
- A high K-BUS (connect BUS to 12 V via a 10 K pull up resistor)
- The C23 BM for radio / audio functions
- The nav. computer for the display functions (display is driven by the CSI board of 22SY561, signals are sent via NAVBUS)

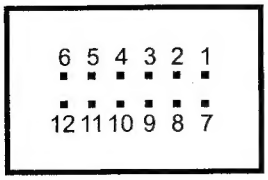
Because of the complex functionality the description of controls is omitted in this Service Manual.
It is recommended to refer to the BMW instructions for use which can be ordered at your local dealer or garage.

This Service Manual explains the electrical hardware and the mechanics of the modul only.
The BUS commands and communication structure can not be verified without special equipment (software and RS232/I-BUS interface).

## TECHNICAL DATA

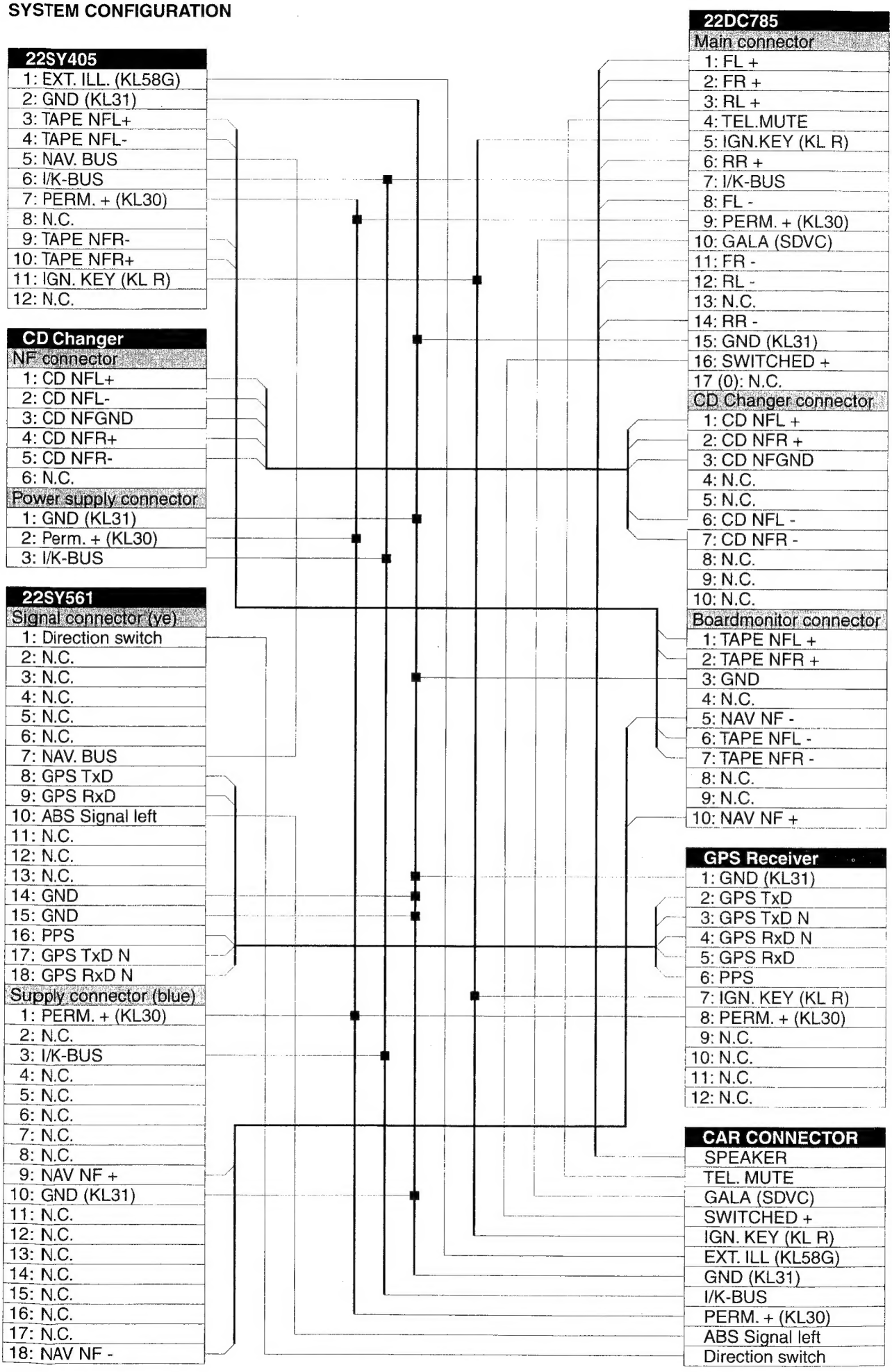
| | | |
|---|---|---|
| GENERAL | Power Supply | 6 V–16 V<br>for max. illumination acc. spec.13.5 V min.<br>for tape deck functions acc. spec.10 V min.<br>display illumination OFF at 17 V<br>display illumination ON again at 16 V<br>tape deck OFF at 10 V |
| | Quiescent current | 0.1 mA |
| | Playback current | < 1.7 A (peak < 2 A Cass. insert)<br>for max. illum., display heater on, Cass. FFW |
| | ON/OFF indication | ON: KL R > 6.5 V<br>OFF: KL R < 2.7 V |
| SCA4.4 TAPE DECK | Number of tracks | 2 x 2 |
| | Tape speed | 4.75 cm/s |
| | Winding time (C60) | < 100 s |
| | Wow & Flutter | < 0.3 % |
| | S/N ratio | > 48 dB DOLBY OFF, METAL<br>> 65 dB DOLBY C, CHROME |
| | THD (at 1KHz) | < 1 % |
| AF PREAMPLIFIER | Output level | 3 $V_{eff}$ |
| | Channel separation | 45 dB (1KHz) |

## CONNECTORBLOCK




1: EXT. ILL. (KL58G)
2: GND (KL31)
3: TAPE L+
4: TAPE L-
5: Nav. BUS
6: K-BUS
7: PERM. + (KL30)
8: N.C.
9: TAPE R-
10: TAPE R+
11: IGN. KEY (KL R)
12: N.C.

## SYSTEM CONFIGURATION

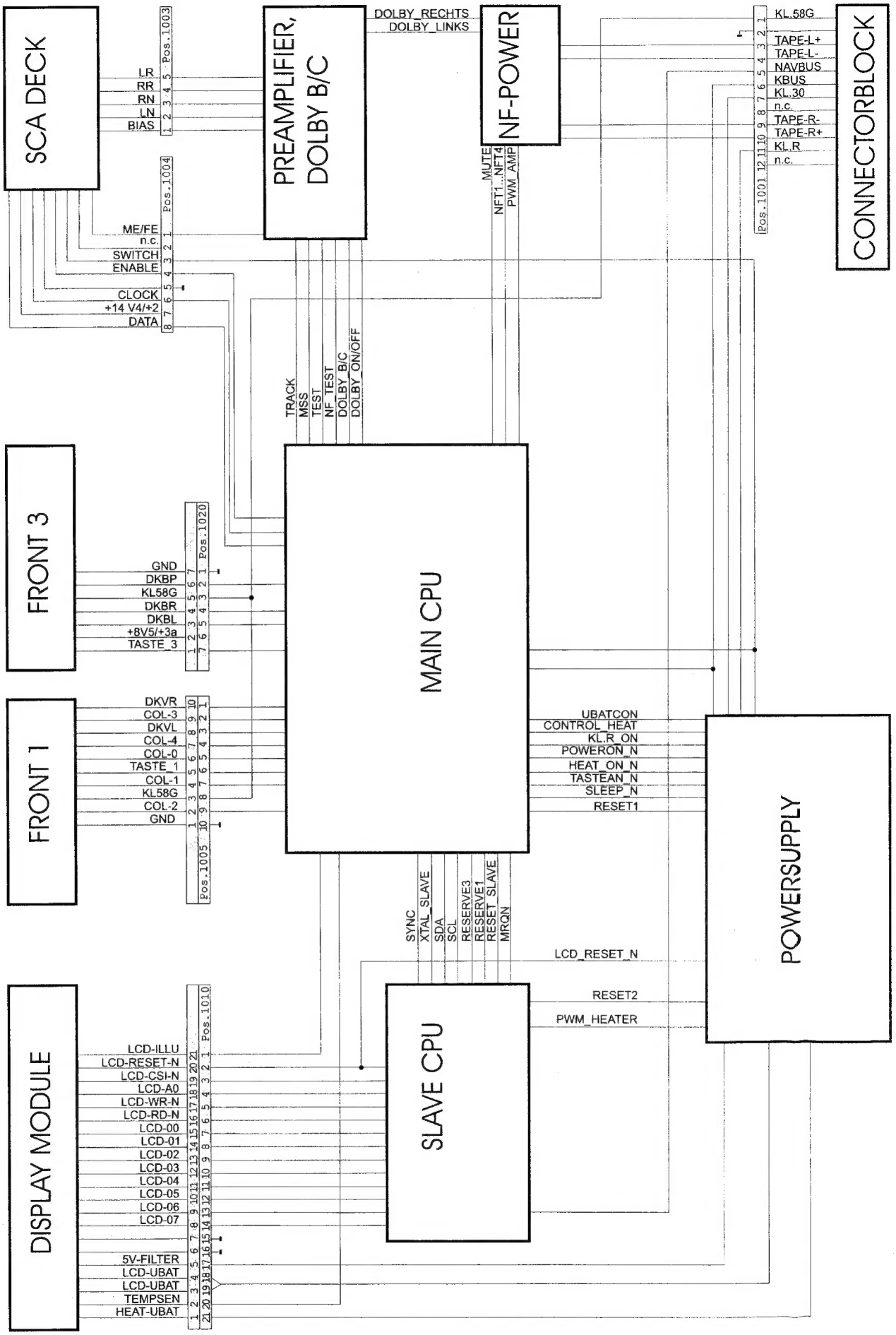


## SIGNAL DESCRIPTION

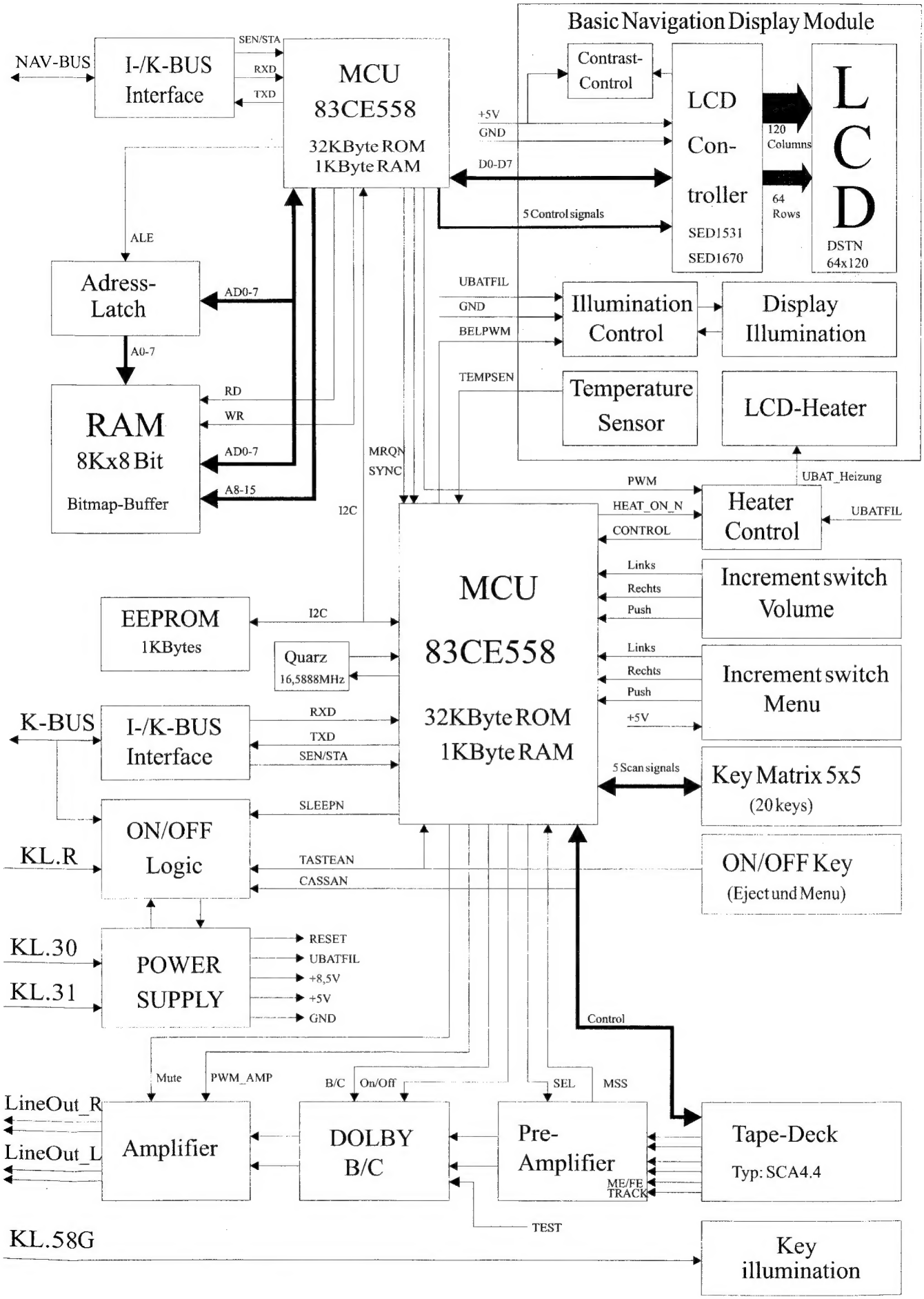
| | |
|---|---|
| +14 V4/+1 | **(M112)** Battery voltage filtered |
| +14 V4/+2 | **(M103)** Battery voltage filtered, switched for AF Power, tape deck and 8.5V stabilizer IC |
| +14 V4/+2b | **(M107)** Battery voltage filtered, switched for NAV-BUS and I/K-BUS |
| +8V5/+3a | **(M102)** 8.5 V ±5%, max. 250 mA. Supply voltage for AF and optical increment switch. |
| +5V0/+7 | **(M100)** 5.0 V ±2%, max. 200 mA. Supply voltage for logic IC's and display. |
| 5V-FILTER | **(M804)** 5.0 V ±5%, max. 15 mA.Supply voltage for LCD controller interface. |
| BIAS | **(M505)** Common line of magnetic head (3.3 V DC) |
| CLOCK | **(M704)** 5.0 V. Tact signal for tape deck, pulses to GND during deck operation. |
| COL-0 | **(M306)** 5.0 V. Keymatrix scan signal |
| COL-1 | **(M307)** 5.0 V. Keymatrix scan signal |
| COL-2 | **(M308)** 5.0 V. Keymatrix scan signal |
| COL-3 | **(M309)** 5.0 V. Keymatrix scan signal |
| COL-4 | **(M310)** 5.0 V. Keymatrix scan signal |
| CONTROL_HEAT | **(M901)** Heater ON/OFF control. Low = heater OFF, High = heater ON |
| DATA | **(M705)** 5.0 V. Data signal for tape deck, pulses to GND during deck operation |
| DKBL | **(M802)** Opt. incr. switch left. Alternating: High..... Low..... Low..... High..... High..... a.s.o |
| DKBR | **(M801)** Opt. incr. switch right. Alternating: High..... High..... Low..... Low..... High..... a.s.o. |
| DKBP | **(M800)** Opt. incr. switch push. Low = button pushed |
| DKVL | **(M312)** Mech. incr. switch left. Alternating: High..... Low..... High a.s.o. |
| DKVR | **(M313)** Mech. incr. switch right. Alternating: High..... Low..... High a.s.o. |
| DOLBY_B/C | **(Trans. Pos.7501, Base)** Low = DOLBY B, High = DOLBY C |
| DOLBY_LINKS | **(M400)** Dolby level left = 300mV$_{eff}$ (test tape 200nWb/m, 400Hz) to be aligned with poti 3544 |
| DOLBY_ON/OFF | **(Trans. Pos.7500, Base)** Low = DOLBY ON, High = DOLBY OFF |
| DOLBY_RECHTS | **(M401)** Dolby level right = 300mV$_{eff}$ (test tape 200nWb/m, 400Hz) to be aligned with poti 3543 |
| ENABLE | **(M706)** Direction control of tape deck interface. Low = µC->Deck, High = Deck->µC. 5 pulses to GND when RESET |
| HEAT_ON_N | **(M902)** Heater ON/OFF switch. Low = Heater ON, High = Heater OFF |
| HEAT-UBAT | **(M821)** Heater supply. Low (< 0.2 V) = Heater OFF, High (Battery voltage) = Heater ON |
| KBUS | **(M316)** Data BUS on battery voltage level |
| KL.30 | **(M304)** Battery voltage, perm. + |
| KL.58G | **(M302)** Illumination supply, max. current 180 mA (at 13.5 V) |
| KL.R | **(M319)** Power supply from ignition key |
| KL.R_ON | **(M105)** Ignition ON / OFF control (high activ). 3.2 V when ignition ON |
| LCD_RESET_N | **(M110)** Reset signal for LCD controller (min. 1µs low activ). Low < 0.75 V, High > 4.25 V |
| LCD-00...07 | **(M809...M816)** Control / Display signals for LCD |
| LCD-A0 | **(M806)** Low -> LCD-00...07 are control data, High -> LCD-00...07 are display data |
| LCD-CSI-N | **(M805)** Chip select not signal (Low-activ) |
| LCD-ILLU | **(M818)** PWM signal (2050 Hz) for ill. control. Low (<0.8 V) = ill. ON, High (>2.4 V) = ill. OFF. 0-100% in 256 steps |
| LCD-RD-N | **(M808)** Read signal for LCD Controller (Low activ) |
| LCD-UBAT | **(M820)** Supply voltage for LCD (Battery voltage) |
| LCD-WR-N | **(M807)** Write signal for LCD Controller (Low activ) |
| LN | **(M501)** Left channel, NOR direction (3.3 V DC) |
| LR | **(M502)** Left channel, REV direction (3.3 V DC) |
| ME/FE | **(M507)** Low = FE, High = ME |
| MRQN | **(IC Pos.7203, Pin 43)** I²C BUS request line from slave controller (Low activ) |
| MSS | **(M508)** Low = NO modulation on tape, High = modulation on tape |
| MUTE | **(Trans. Pos.7402, Base)** Preamplifier mute signal. Low (0.0 V) = AF out, High (0.7 V) = AF mutet |
| NAVBUS | **(M315)** Display data BUS on battery voltage level |
| NF_TEST * | **(IC Pos.7503, Pins 1+28)** PWM reference signal for AF level test |
| NFT1...NFT4 | **(IC Pos.7203, Pins 9...12)** AF level for amplifying control |
| POWERON_N | **(IC Pos.7203, Pin 37)** Control signal to switch supply voltages +8V5/+3a, HEAT-UBAT, +14V4/+2. Low = voltages ON |
| PWM_AMP | **(Trans. Pos.7403, Base)** PWM signal for continuously amplifying control |
| PWM_HEATER | **(M905)** PWM signal to enable the heater circuit. Interrupts HEAT_ON_N in case of a hardware malfunction. |
| RESERVE1+3 | **(IC Pos.7203, Pin 19+21)** Reserved signal lines between main- and slave-controller (5.0 V level) |
| RESET_SLAVE | **(M601)** Logic reset signal from main CPU after power interruption. High activ. |
| RESET1 | **(M101)** Power reset signal for main CPU (min. 10ms high activ). Low < 0.8 V, High > 3.85 V |
| RESET2 | **(M101)** Power reset signal for slave CPU (min. 10ms high activ). Low < 0.8 V, High > 3.85 V |
| RN | **(M503)** Right channel, NOR direction (3.3 V DC) |
| RR | **(M504)** Right channel, REV direction (3.3 V DC) |
| SCL | **(IC Pos.7203, Pin 39)** Clock signal for I²C BUS (5.0 V level) |
| SDA | **(IC Pos.7203, Pin 40)** Data signal for I²C BUS (5.0 V level) |
| SLEEP_N | **(IC Pos.7203, Pin 38)** Switch OFF signal (Low activ 3 ms) if KL-R OFF or I/K BUS not activ for 60 s. |
| SWITCH | **(M703)** Cassette insert pulse. High (11.0 V) = Cassette insert and cassette standby |
| SYNC | **(IC Pos.7203, Pin 20)** Handshake signal for synchronisation of main- and slave-CPU. High activ when unit starts up. |
| TAPE-L- | **(M314)** 1.5 V$_{eff}$ at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| TAPE-L+ | **(M300)** 1.5 V$_{eff}$ at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| TAPE-R- | **(M317)** 1.5 V$_{eff}$ at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| TAPE-R+ | **(M318)** 1.5 V$_{eff}$ at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| TASTE_1 | **(M311)** High (11.5 V) = Eject button released, Low = Eject button pushed |
| TASTE_3 | **(M803)** High (11.5 V) = Menu button released, Low = Menu button pushed |
| TASTEAN_N | **(Trans. Pos.7103, Coll.)** Event switch ON signal. High = Menu or Eject released, Low = Menu or Eject pushed |
| TEMPSEN | **(M817)** Temperature related voltage from display for heater ON/OFF decision. $U_{25°C}$~3.8 V |
| TEST * | **(Trans. Pos.7502, Base)** High (0.7 V) = NF_TEST disabled, Low = NF_TEST enabled (Dolby IC switched to AUX) |
| TRACK | **(M506)** Low = REV. direction, High = NOR. direction |
| UBATCON | **(M108)** KL.R control voltage. Over-/undervoltage indication for switch OFF (~1.7V for KL.R=10V, ~2.9V for KL.R=17V) |
| XTAL_SLAVE | **(IC Pos.7602, Pin 52)** Tact frequency (16.5888 MHz) for main- and slave-CPU (DC ~ 1.4 V) |

* only for production purposes

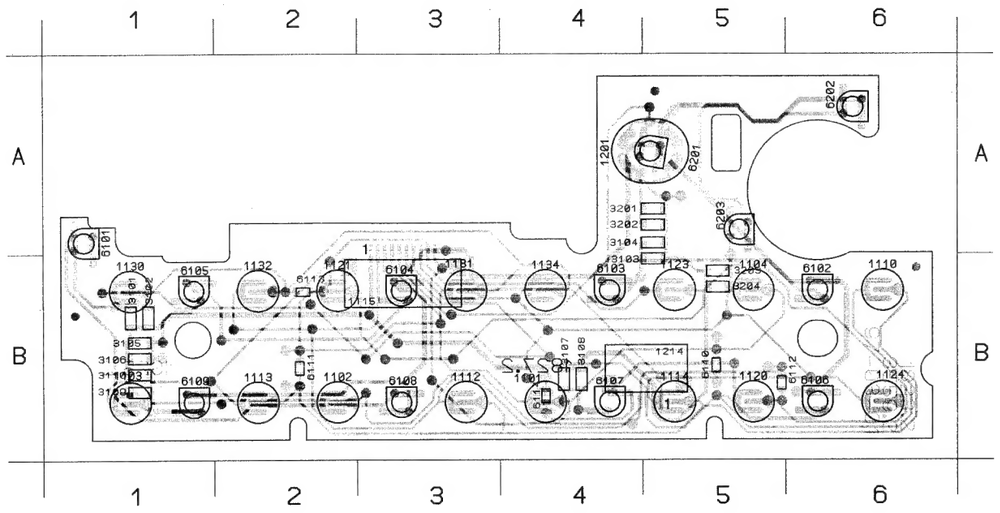
## WIRING DIAGRAM



## BLOCK DIAGRAM

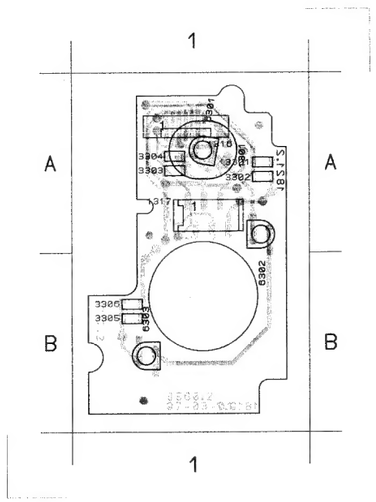


## FRONT PWB 1

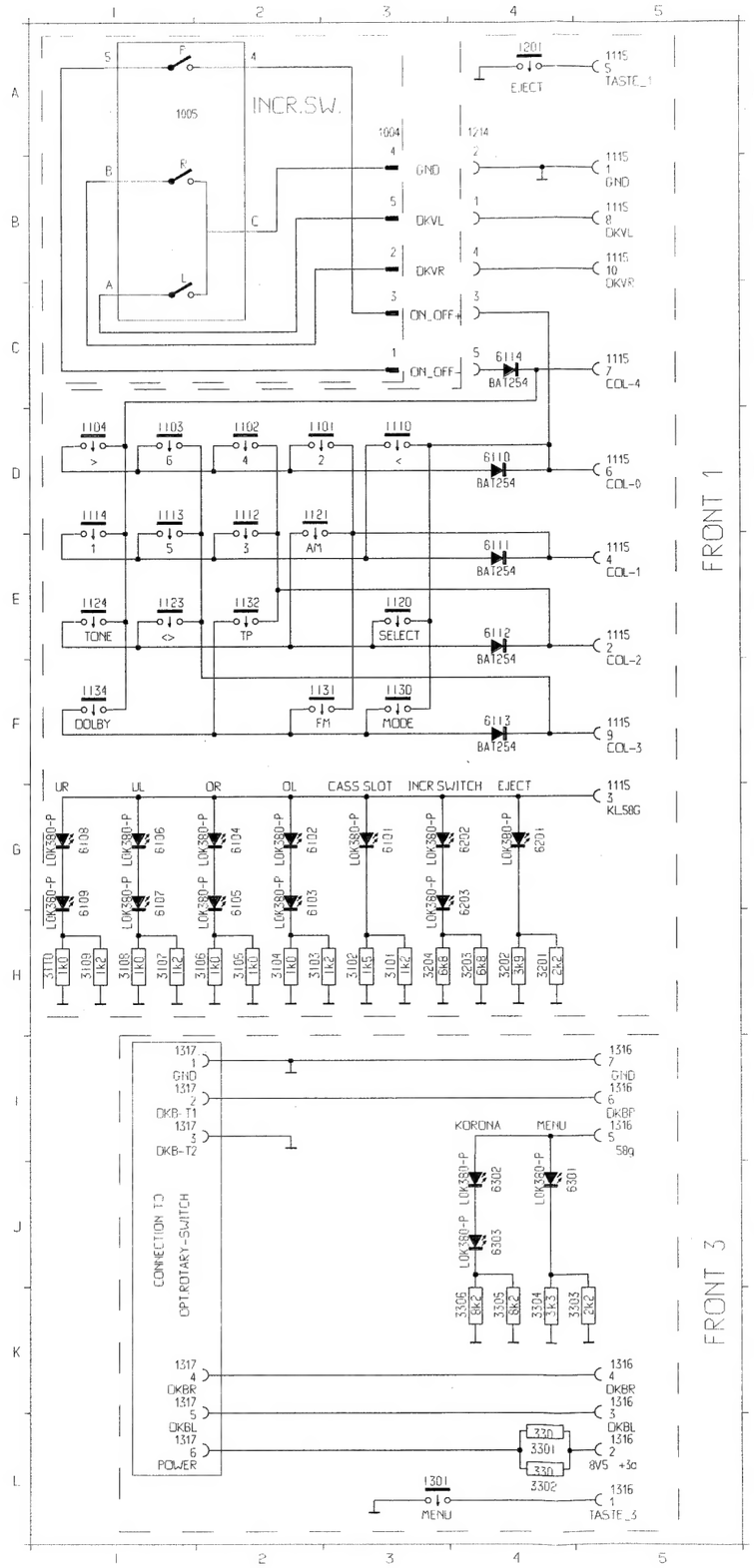



| | | | | |
|---|---|---|---|---|
| 1101 B 4 | 1123 B 5 | 3104 A 5 | 6101 A 1 | 6112 B 5 |
| 1102 B 2 | 1124 B 6 | 3105 B 1 | 6102 B 6 | 6113 B 2 |
| 1103 B 1 | 1130 B 1 | 3106 B 1 | 6103 B 4 | 6114 B 4 |
| 1104 B 5 | 1131 B 3 | 3107 B 4 | 6104 B 3 | 6201 A 5 |
| 1110 B 6 | 1132 B 2 | 3108 B 4 | 6105 B 1 | 6202 A 6 |
| 1112 B 3 | 1134 B 4 | 3109 B 1 | 6106 B 6 | 6203 A 5 |
| 1113 B 2 | 1201 A 5 | 3110 B 1 | 6107 B 4 | |
| 1114 B 5 | 1214 B 5 | 3201 A 5 | 6108 B 3 | |
| 1115 B 3 | 3101 B 1 | 3202 A 5 | 6109 B 1 | |
| 1120 B 5 | 3102 B 1 | 3203 B 5 | 6110 B 5 | |
| 1121 B 2 | 3103 B 5 | 3204 B 5 | 6111 B 2 | |

## FRONT PWB 3

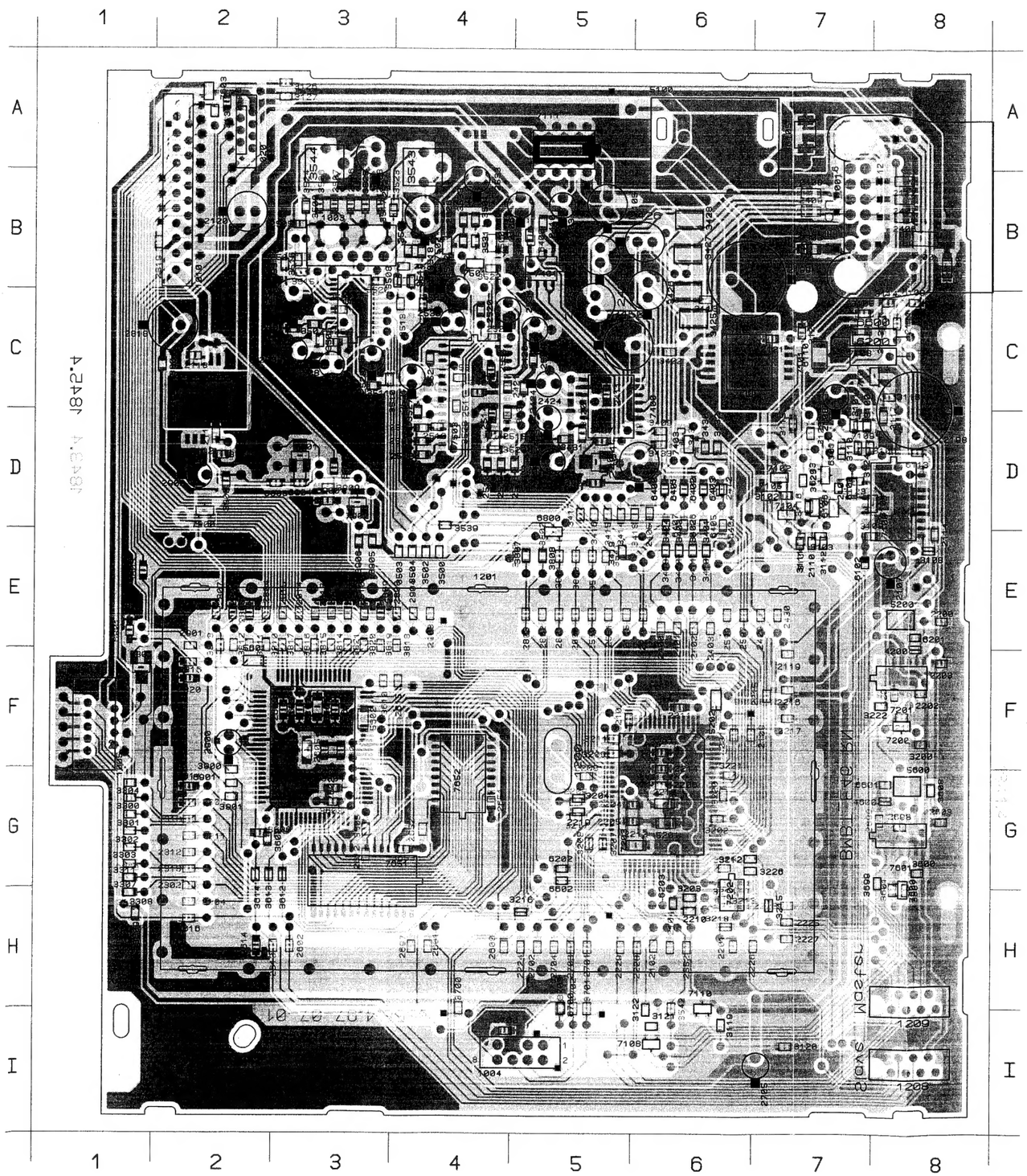



| | |
|---|---|
| 1301 A 1 | |
| 1316 A 1 | |
| 1317 A 1 | |
| 3301 A 1 | |
| 3302 A 1 | |
| 3303 A 1 | |
| 3304 A 1 | |
| 3305 B 1 | |
| 3306 B 1 | |
| 6301 A 1 | |
| 6302 A 1 | |
| 6303 B 1 | |




| | | |
|---|---|---|
| 1001 | A | 3 |
| 1005 | A | 1 |
| 1101 | D | 3 |
| 1102 | D | 2 |
| 1103 | D | 1 |
| 1104 | D | 1 |
| 1110 | D | 3 |
| 1112 | D | 2 |
| 1113 | D | 1 |
| 1114 | D | 1 |
| 1115 | B | 5 |
| 1115 | E | 5 |
| 1115 | G | 5 |
| 1115 | E | 5 |
| 1115 | A | 5 |
| 1115 | D | 5 |
| 1115 | C | 5 |
| 1115 | B | 5 |
| 1115 | F | 5 |
| 1115 | B | 5 |
| 1120 | E | 3 |
| 1121 | D | 2 |
| 1123 | F | 1 |
| 1124 | E | 1 |
| 1130 | F | 3 |
| 1131 | F | 3 |
| 1132 | E | 2 |
| 1134 | F | 1 |
| 1201 | A | 4 |
| 1214 | A | 4 |
| 1301 | L | 3 |
| 1316 | L | 5 |
| 1316 | L | 5 |
| 1316 | K | 5 |
| 1316 | K | 5 |
| 1316 | I | 5 |
| 1316 | I | 5 |
| 1317 | I | 1 |
| 1317 | I | 1 |
| 1317 | I | 1 |
| 1317 | K | 1 |
| 1317 | K | 1 |
| 1317 | L | 1 |
| 3101 | H | 3 |
| 3102 | H | 3 |
| 3103 | H | 2 |
| 3104 | H | 2 |
| 3105 | H | 2 |
| 3106 | H | 2 |
| 3107 | H | 1 |
| 3108 | H | 1 |
| 3109 | H | 1 |
| 3110 | H | 1 |
| 3201 | H | 4 |
| 3202 | H | 4 |
| 3203 | H | 4 |
| 3204 | H | 3 |
| 3301 | L | 4 |
| 3302 | L | 4 |
| 3303 | K | 5 |
| 3304 | K | 4 |
| 3305 | K | 4 |
| 3306 | K | 4 |
| 6101 | G | 3 |
| 6102 | G | 2 |
| 6103 | G | 2 |
| 6104 | G | 2 |
| 6105 | G | 2 |
| 6106 | G | 1 |
| 6107 | G | 1 |
| 6108 | G | 1 |
| 6109 | G | 1 |
| 6110 | D | 4 |
| 6111 | E | 4 |
| 6112 | E | 4 |
| 6113 | F | 4 |
| 6114 | C | 4 |
| 6201 | G | 4 |
| 6202 | G | 4 |
| 6203 | G | 4 |
| 6301 | J | 4 |
| 6302 | J | 4 |
| 6303 | J | 4 |

## MAIN-PWB A-SIDE VIEW




1001 B 7
1003 B 3
1004 I 5
1005 F 1
1010 B 2
1020 A 2
1100 B
1200 F 5
1201 G 4
1208 I 8
1209 H 8
2100 B
2101 D 7
2102 H 5
2103 B 5
2104 H 5
2105 B 5
2106 B 5
2107 E 8
2108 C 7
2109 F 5
2110 E 7
2111 C 8
2112 B 8
2113 C 8
2114 E 8
2115 E 5
2116 A 7
2117 D 2
2118 C 2
2119 F 7
2120 B 2
2121 C 7
2198 C 8
2199 B 6

2404 D 6
2405 D 6
2406 B 3
2407 B 8
2408 B 7
2409 B 7
2410 B 5
2411 C 5
2412 D 6
2413 D 6
2414 E 8
2415 D 6
2420 C 5
2421 C 4
2423 D 5
2424 C 5
2425 B 6
2426 B 6
2427 B 5
2428 C 5
2429 E 4
2430 E 7
2431 D 5
2450 C 5
2501 C 3
2502
2503
2504 B 4
2505
2506
2509 D 4
2510 D 4

2210 H 6

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2516 D 5
2517 D 4
2518 D 4
2519
2520 C 4

2219 G 5

2524 C 5
2525 B 4
2526 B 4
2527 A 3
2528 C 3
2529 C 3
2530 C 4
2531 C 4
2532 C 3
2533 B 4
2534 C 4
2535 C 3

2600 F 2
2601 F 2
2602 F 2
2603 F 3
2604 F 3
2605 F 3
2606 F 3
2607 F 3
2608 F 3
2609 F 3
2610 F 3
2611 F 3
2612 G 3
2613 H 3
2614 F 3
2615 F 3
2616 F 3
2651 G 4
2652 G 4
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2708 E 5
2709 E 5

2818 C 2

2900 F 2

2902 D 2

3100 D 7
3101 D 7
3102 D 7

3108 E 8
3109 E
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3111 E 7
3112 E 7
3113
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3120 I 7
3121 I 6
3122 I 6
3123 D 7
3124 D 7
3125 D 7
3126 A 3
3127 A 3
3128 D 7
3129 C 7
3130 A 2
3131 D 2
3200 F 5
3201 F 8
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3203 H 6
3204 G 5
3207 G 5
3208 G 5
3209 F 5
3210 F 5
3211 F 5
3212 G 6
3213
3214
3215 H 7
3216 H 5
3217
3218
3219
3220
3221 G 5
3222 F 8
3226 G 6
3300 G 1
3301 G 1
3302 G 1
3303 G 1
3304 G 1
3307 G 1
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3310
3311 G 1
3401 E 6
3402 E 6
3403 E 6
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3409
3410

3414 D 5
3415 D 5
3416 D 5
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3520 B 3
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3701 H 5
3702 H 5
3703 H 5
3800 E 5
3801 E 5
3802 E 5
3803 E 5
3804 C 2
3805 E 1
3807 E 5
3808 E 5
3810 E 2
3811 E 2
3812 E 2
3813 E 2
3814 E 3
3815 E 3
3816 E 3
3817 E 3
3818 E 4
3819 E 3
3820 E 3
3821 E 3
3900 G 2
3901 G 2
3902 D 2
3903 D 3
3904 D 3
3905 E 3
3906 E 3
3908 D 3
3909 D 3
4200 E 8
4600 G 8
5100 A 6
5200 E 8
5201 G 6
5202 F 6
5600 G 8
5601 F 2
5602 F 3
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6101 D 7
6102 E 7
6103 D 7
6104 D 7
6105 A 7
6106 D 7
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6110 C 7
6113 D 8
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7103 C 7
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J101 H 5
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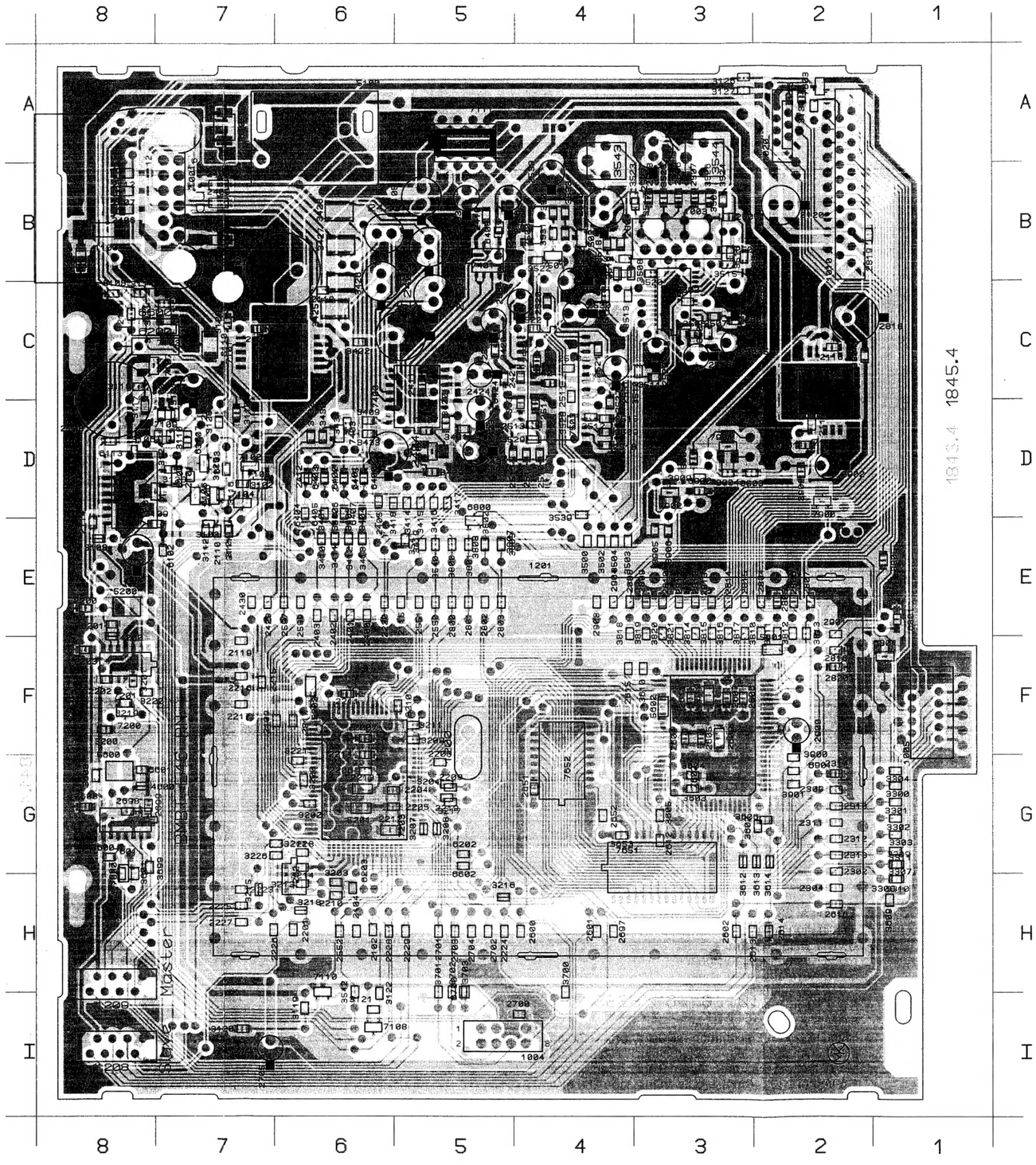
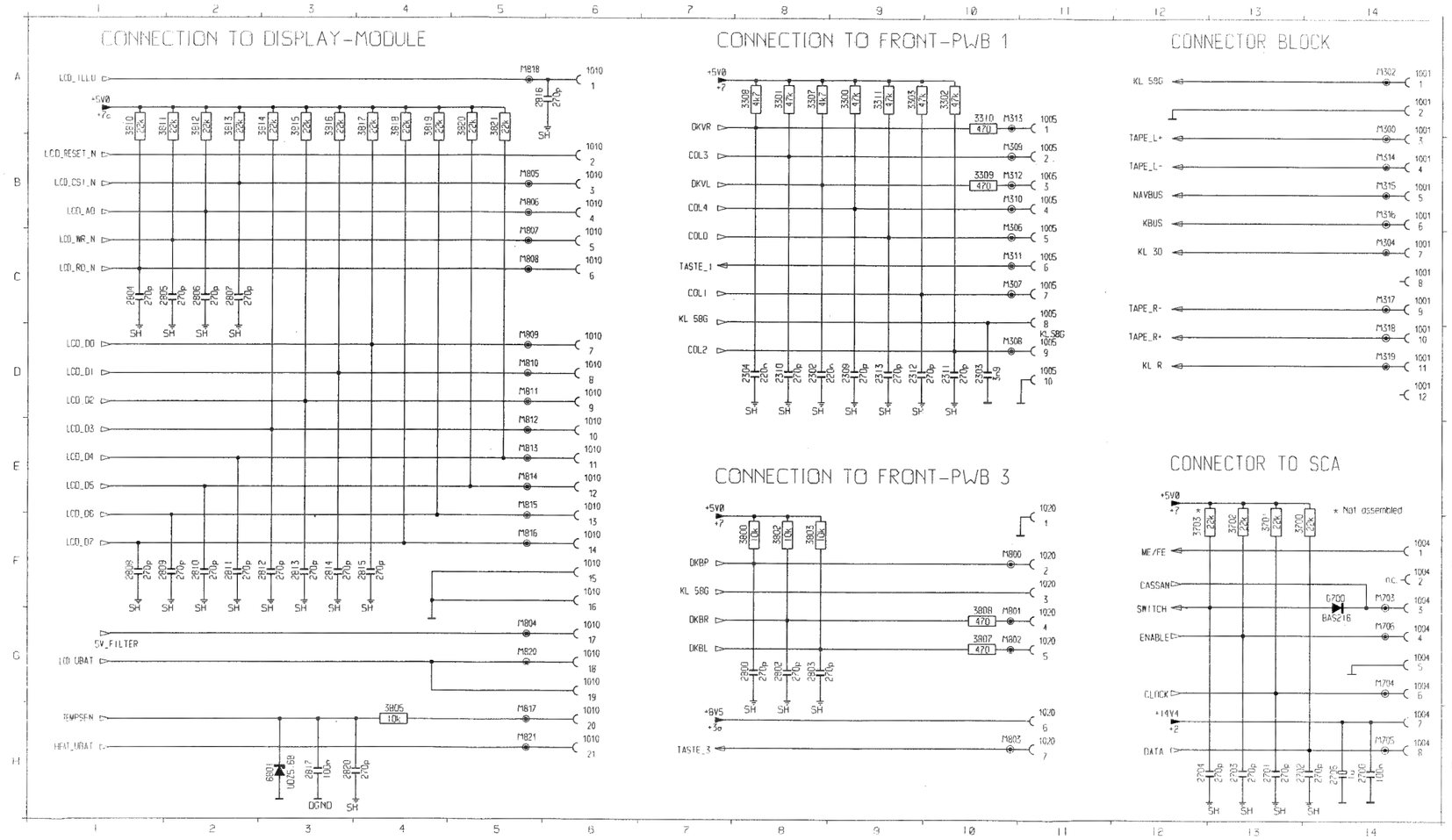
**MAIN-PWB B-SIDE VIEW**



## CONNECTORS

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1001 A14 | 1004 F14 | 1005 C11 | 1010 E 6 | 1020 F11 | 2313 D 9 | 2807 C 2 | 3301 A 8 | 3302 F 8 | 3318 A 4 | M310 B10 | M706 G14 | M812 E 5 |
| 1001 A14 | 1004 F14 | 1005 C11 | 1010 E 6 | 1020 F11 | 2700 H14 | 2808 F 1 | 3302 A10 | 3303 F 8 | 3319 A 4 | M311 C10 | M800 F10 | M813 E 5 |
| 1001 A14 | 1004 G14 | 1005 D11 | 1010 E 6 | 1020 G11 | 2701 H13 | 2809 F 2 | 3303 A 9 | 3305 H 4 | 3820 A 5 | M312 B10 | M801 G10 | M814 E 5 |
| 1001 B14 | 1004 G14 | 1005 D11 | 1010 E 6 | 1020 G11 | 2702 H14 | 2810 F 2 | 3307 A 8 | 3307 G10 | 3821 A 5 | M313 A10 | M802 G10 | M815 E 5 |
| 1001 B14 | 1004 G14 | 1010 A 6 | 1010 F 6 | 1020 H11 | 2703 H13 | 2811 F 2 | 3308 A 8 | 3308 G10 | 6700 F14 | M314 B14 | M803 H10 | M816 F 5 |
| 1001 B14 | 1004 H14 | 1010 B 6 | 1010 F 6 | 1020 H11 | 2704 H12 | 2812 F 3 | 3309 B10 | 3810 A 1 | 6801 H 3 | M315 B14 | M804 G 5 | M817 H 5 |
| 1001 C14 | 1004 H14 | 1010 B 6 | 1010 F 6 | 2302 D 8 | 2705 H14 | 2813 F 3 | 3310 A10 | 3811 A 1 | M300 A14 | M316 B14 | M805 B 5 | M818 A 5 |
| 1001 C14 | 1005 A11 | 1010 B 6 | 1010 G 6 | 2303 D10 | 2800 G 8 | 2814 F 3 | 3311 A 9 | 3812 A 2 | M302 A14 | M317 C14 | M806 B 5 | M820 G 5 |
| 1001 C14 | 1005 B11 | 1010 C 6 | 1010 G 6 | 2304 D 8 | 2802 G 8 | 2815 F 4 | 3700 F13 | 3813 A 2 | M304 C14 | M318 D14 | M807 C 5 | M821 H 5 |
| 1001 D14 | 1005 B11 | 1010 C 6 | 1010 G 6 | 2309 D 9 | 2803 G 8 | 2816 A 5 | 3701 F13 | 3814 A 3 | M305 B10 | M319 D14 | M808 C 5 | |
| 1001 D14 | 1005 B11 | 1010 D 6 | 1010 H 6 | 2310 D 8 | 2804 C 1 | 2817 H 3 | 3702 F13 | 3815 A 3 | M307 C10 | M703 F14 | M809 D 5 | |
| 1001 D14 | 1005 C11 | 1010 D 6 | 1010 H 6 | 2311 D10 | 2805 C 2 | 2820 H 3 | 3703 F12 | 3816 A 3 | M308 D10 | M704 G14 | M810 D 5 | |
| 1001 F14 | 1005 C11 | 1010 D 6 | 1020 E11 | 2312 D 9 | 2806 C 2 | 3300 A 9 | 3800 F 8 | 3817 A 4 | M309 B10 | M705 H14 | M811 D 5 | |



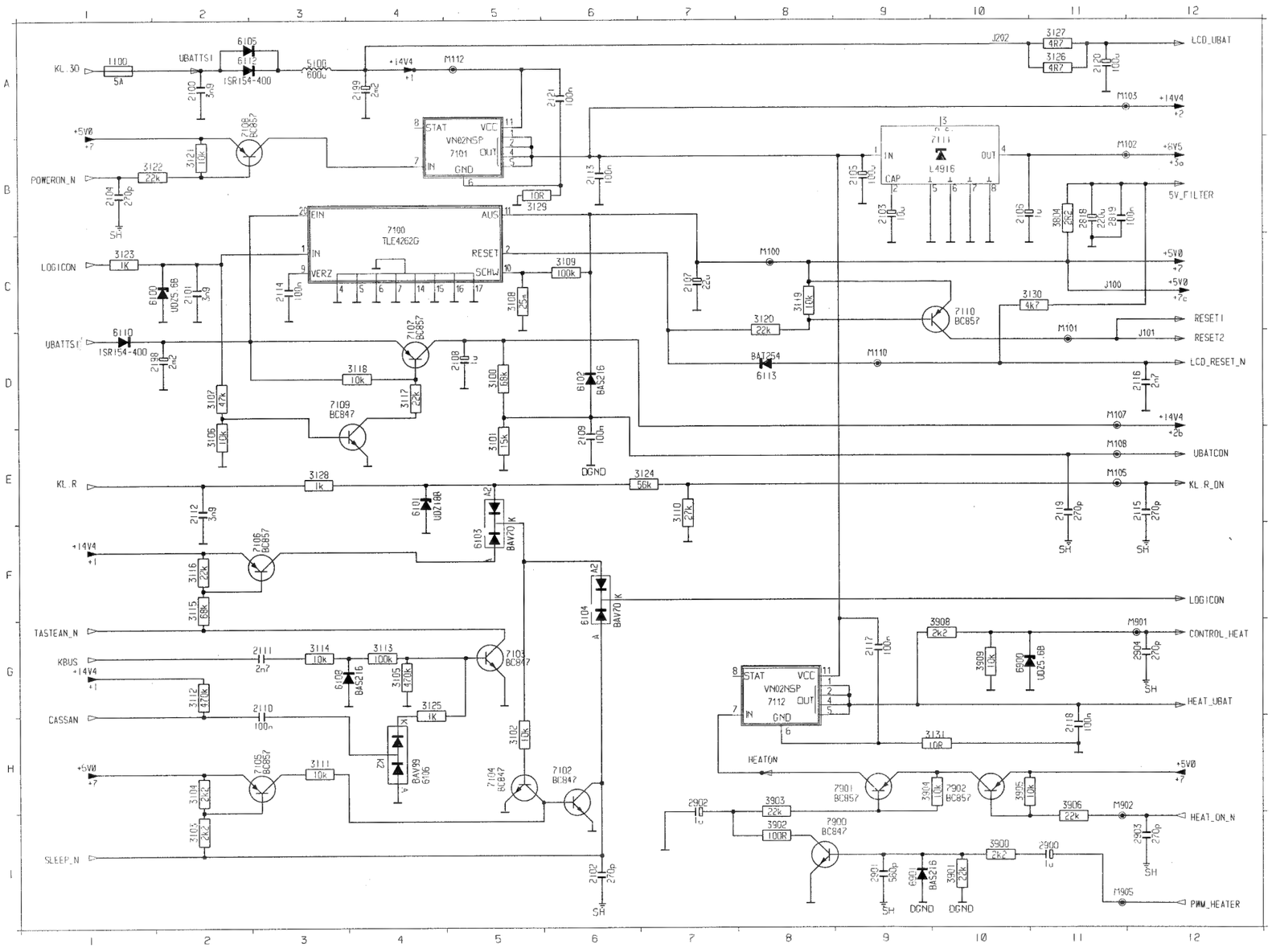

Values (approximate) at M817 in relation to temperature

| T [°C] | U [V] |
|---|---|
| -40 | 4.94 |
| -30 | 4.88 |
| -20 | 4.80 |
| -10 | 4.67 |
| -0 | 4.49 |
| +10 | 4.24 |
| +20 | 3.94 |
| +30 | 3.59 |
| +40 | 3.20 |
| +50 | 2.78 |
| +60 | 2.39 |
| +70 | 2.02 |
| +80 | 1.69 |

| | | |
|---|---|---|
| TAPE-L+ | (M300) | 1.5 Veff at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| KL.58G | (M302) | Illumination supply, max. current 180 mA (at 13.5 V) |
| KL.30 | (M304) | Battery voltage, perm. + |
| COL-0 | (M306) | 5.0 V. Keymatrix scan signal |
| COL-1 | (M307) | 5.0 V. Keymatrix scan signal |
| COL-2 | (M308) | 5.0 V. Keymatrix scan signal |
| COL-3 | (M309) | 5.0 V. Keymatrix scan signal |
| COL-4 | (M310) | 5.0 V. Keymatrix scan signal |
| TASTE_1 | (M311) | High (11.5 V) = Eject button released, Low = Eject button pushed |
| DKVL | (M312) | Mech. incr. switch left. Alternating: High.....Low..... High a.s.o. |
| DKVR | (M313) | Mech. incr. switch right. Alternating: High.....Low..... High a.s.o. |
| TAPE-L- | (M314) | 1.5 Veff at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| NAVBUS | (M315) | Display data BUS on battery voltage level |
| KBUS | (M316) | Data BUS on battery voltage level |
| TAPE-R- | (M317) | 1.5 Veff at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| TAPE-R+ | (M318) | 1.5 Veff at 235 Ω (measured with test tape 250 nW/m, 315 Hz) |
| KL.R | (M319) | Power supply from ignition key |
| SWITCH | (M703) | Cassette insert pulse. High (11.0 V) = Cassette insert and cassette standby |

| | | |
|---|---|---|
| CLOCK | (M704) | 5.0 V. Tact signal for tape deck, pulses to GND during deck operation. |
| DATA | (M705) | 5.0 V. Data signal for tape deck, pulses to GND during deck operation |
| ENABLE | (M706) | Direction control of tape deck interface. Low = µC->Deck, High = Deck->µC. 5 pulses to GND when RESET |
| DKBP | (M800) | Opt. incr. switch push. Low = button pushed |
| DKBR | (M801) | Opt. incr. switch right. Alternating: High.....High.....Low..... Low..... High a.s.o. |
| DKBL | (M802) | Opt. incr. switch left. Alternating: High.....Low..... Low..... High.....High a.s.o. |
| TASTE_3 | (M803) | High (11.5 V) = Menu button released, Low = Menu button pushed |
| 5V-FILTER | (M804) | 5.0 V ±5%, max. 15 mA.Supply voltage for LCD controller interface. |
| LCD-CSI-N | (M805) | Chip select not signal (Low-activ) |
| LCD-A0 | (M806) | Low -> LCD-00...07 are control data, High -> LCD-00...07 are display data |
| LCD-WR-N | (M807) | Write signal for LCD Controller (Low activ) |
| LCD-RD-N | (M808) | Read signal for LCD Controller (Low activ) |
| LCD-00...07 | (M809...M816) | Control / Display signals for LCD |
| TEMPSEN | (M817) | Temperature related voltage from display for heater ON/OFF decision. $U_{25°C}$~3.8 V (see table) |
| LCD-ILLU | (M818) | PWM signal (2050 Hz) for ill. control. Low (<0.8 V) = ill. ON, High (>2.4 V) = ill. OFF. 0-100% in 256 steps |
| LCD-UBAT | (M820) | Supply voltage for LCD (Battery voltage) |
| HEAT-UBAT | (M821) | Heater supply. Low (< 0.2 V) = Heater OFF, High (Battery voltage) = Heater ON |

# POWER SUPPLY / ON-OFF LOGIC

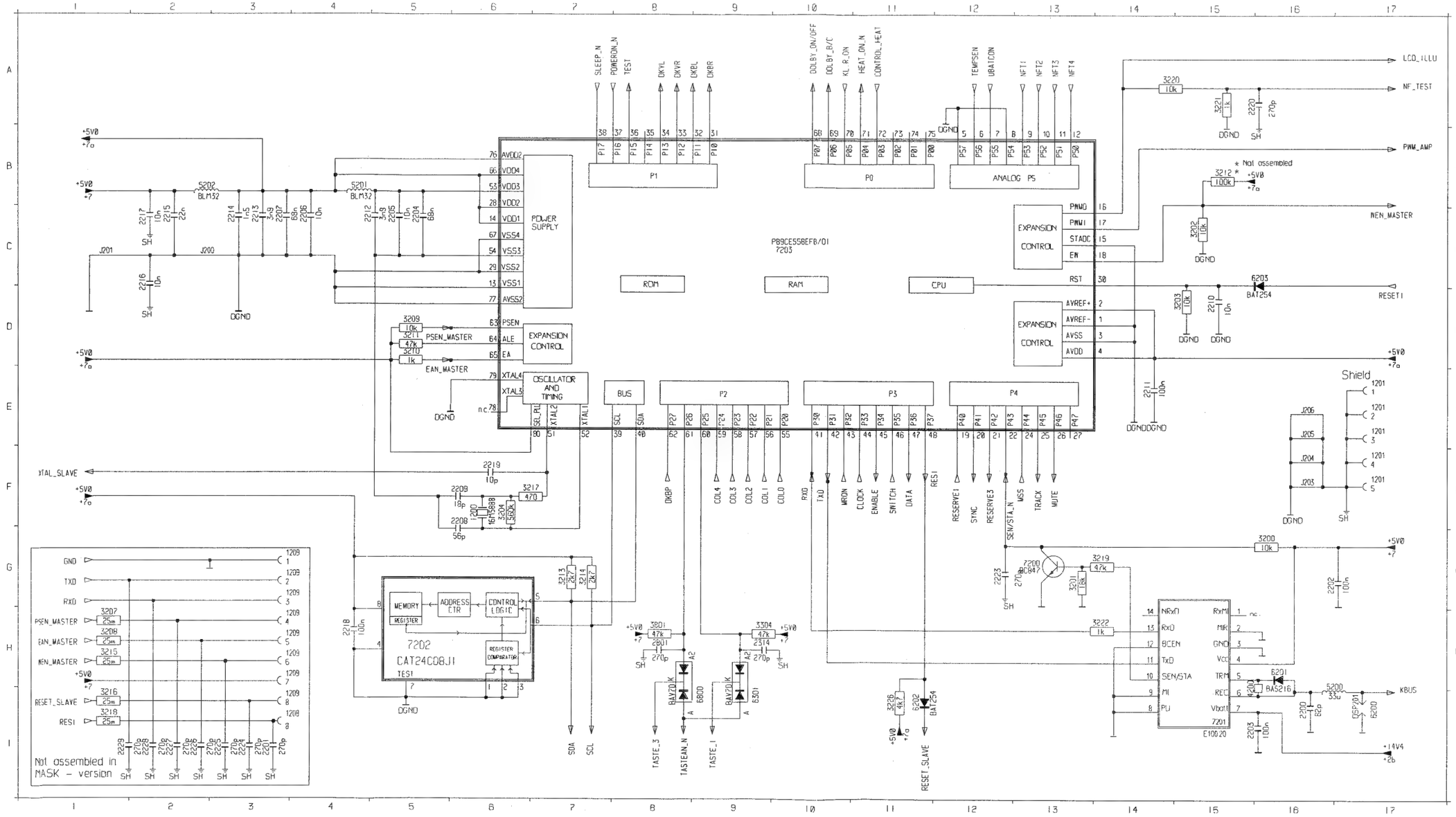



| | | |
|---|---|---|
| +5V0/+7 | (M100) | 5.0 V ±2%, max. 200 mA. Supply voltage for logic IC's and display. |
| RESET1 | (M101) | Power reset signal for main CPU (min. 10ms high activ). Low < 0.8 V, High > 3.85 V |
| RESET2 | (M101) | Power reset signal for slave CPU (min. 10ms high activ). Low < 0.8 V, High > 3.85 V |
| +8V5/+3a | (M102) | 8.5 V ±5%, max. 250 mA. Supply voltage for AF and optical increment switch. |
| +14 V4/+2 | (M103) | Battery voltage filtered, switched for AF Power, tape deck and 8.5V stabilizer IC |
| KL.R_ON | (M105) | Ignition ON / OFF control (high activ). 3.2 V when ignition ON |
| +14 V4/+2b | (M107) | Battery voltage filtered, switched for NAV-BUS and I/K-BUS. |
| UBATCON | (M108) | KL.R control voltage. Over-/undervoltage indication for switch OFF (<1.7V for KL.R=10V, >2.9V for KL.R=17V) |
| LCD_RESET_N | (M110) | Reset signal for LCD controller (min. 1µs low activ). Low < 0.75 V, High > 4.25 V |
| +14 V4/+1 | (M112) | Battery voltage filtered |
| CONTROL_HEAT | (M901) | Heater ON/OFF control. Low = heater OFF, High = heater ON |
| HEAT_ON_N | (M902) | Heater ON/OFF switch. Low = Heater ON, High = Heater OFF |
| PWM_HEATER | (M905) | PWM signal to enable the heater circuit. Interrupts HEAT_ON_N in case of a hardware malfunction. |
| TASTEAN_N | (Trans. Pos.7103, Coll.) | Event switch ON signal. High = Menu or Eject released, Low = Menu or Eject pushed |

# MASTER PROCESSOR

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1200 | F 6 | 1208 | I 3 | 1209 | H 3 | 2203 | I 15 | 2209 | F 6 | 2215 | C 2 | 2223 | G12 | 2229 | I 1 | 3203 | D15 | 3211 | D 5 |
| 1201 | E17 | 1209 | G 3 | 1209 | H 3 | 2204 | C 5 | 2210 | D15 | 2216 | C 2 | 2224 | I 3 | 2314 | H 9 | 3204 | F 6 | 3212 | B15 |
| 1201 | E17 | 1209 | G 3 | 1209 | I 3 | 2205 | C 5 | 2211 | E14 | 2217 | C 2 | 2225 | I 3 | 2801 | H 8 | 3207 | H 1 | 3213 | G 7 |
| 1201 | E17 | 1209 | G 3 | 2200 | I16 | 2206 | C 4 | 2212 | C 4 | 2218 | H 4 | 2226 | I 2 | 3200 | G16 | 3208 | H 1 | 3214 | G 7 |
| 1201 | F17 | 1209 | H 3 | 2201 | I 3 | 2207 | C 3 | 2213 | C 3 | 2219 | F 6 | 2227 | I 2 | 3201 | G13 | 3209 | D 5 | 3215 | H 1 |
| 1201 | F17 | 1209 | H 3 | 2202 | G16 | 2208 | F 6 | 2214 | C 3 | 2220 | A15 | 2228 | I 2 | 3202 | C15 | 3210 | D 5 | 3216 | I 1 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3217 | F 7 | 3226 | I 11 | 5202 | B 2 | 6800 | I 9 | J201 | C 1 | | | | | | | | | | |
| 3218 | I 1 | 3304 | H 9 | 6200 | I 17 | 7200 | G13 | J203 | F16 | | | | | | | | | | |
| 3219 | G14 | 3801 | H 8 | 6201 | H16 | 7201 | I 15 | J204 | F16 | | | | | | | | | | |
| 3220 | A14 | 4200 | H15 | 6202 | I 11 | 7202 | H 5 | J205 | E16 | | | | | | | | | | |
| 3221 | A15 | 5200 | H17 | 6203 | C16 | 7203 | C10 | J206 | E16 | | | | | | | | | | |
| 3222 | H14 | 5201 | B 4 | 6301 | I 9 | J200 | C 2 | | | | | | | | | | | | |




| | | |
|---|---|---|
| NFT1...NFT4 | (IC Pos.7203, Pins 9...12) | AF level for amplifying control |
| RESERVE1+3 | (IC Pos.7203, Pin 19+21) | Reserved signal lines between main- and slave-controller (5.0 V level) |
| SYNC | (IC Pos.7203, Pin 20) | Handshake signal for synchronisation of main- and slave-CPU. High activ when unit starts up. |
| POWERON_N | (IC Pos.7203, Pin 37) | Control signal to switch supply voltages +8V5/+3a, HEAT-UBAT, +14V4/+2. Low = voltages ON |
| SLEEP_N | (IC Pos.7203, Pin 38) | Switch OFF signal (Low activ 3 ms) if KL-R OFF or I/K BUS not activ for 60 s. |
| SCL | (IC Pos.7203, Pin 39) | Clock signal for I2C BUS (5.0 V level) |
| SDA | (IC Pos.7203, Pin 40) | Data signal for I2C BUS (5.0 V level) |
| MRQN | (IC Pos.7203, Pin 43) | I2C BUS request line from slave controller (Low activ) |

# SLAVE PROCESSOR

1208 G 3
1208 H 3
1208 H 3
1208 H 3

1209 H 3
1208 I 3
1208 I 3
2600 I 2

2601 I 2
2602 I 2
2603 I 5
2604 B 4

2605 B 4
2606 B 3
2607 B 2
2609 B 3

2610 B 2
2611 B 2
2612 D 3
2613 I 3

2614 I 3
2615 D14
2616 H10
2651 H17

2652 H17
2697 H 8
2698 G 4
2699 H 5

3600 G 8
3601 H 7
3602 C13
3603 D 4

3604 D 4
3605 D 3
3606 C14
3607 G 7

3609 H10
3610 D14
3612 H 1
3613 H 1

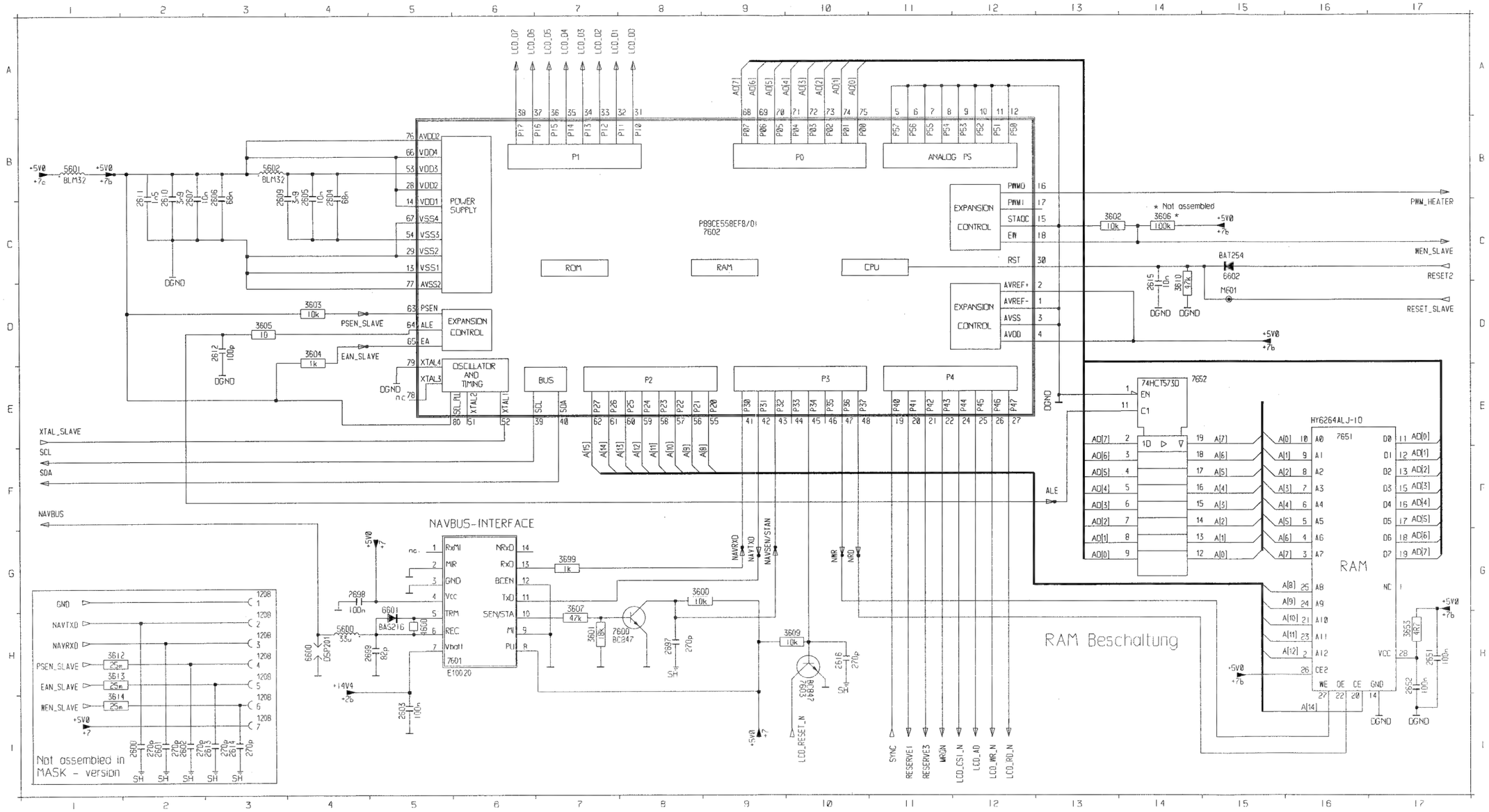
3614 I 1
3653 H17
3699 G 7
4600 H 5

5600 H 4
5601 B 1
5602 B 3
6600 H 4

6601 H 5
6602 C15
7600 H 7
7601 H 5

7602 C 9
7603 H10
7651 E16
7652 E14

M601 D15

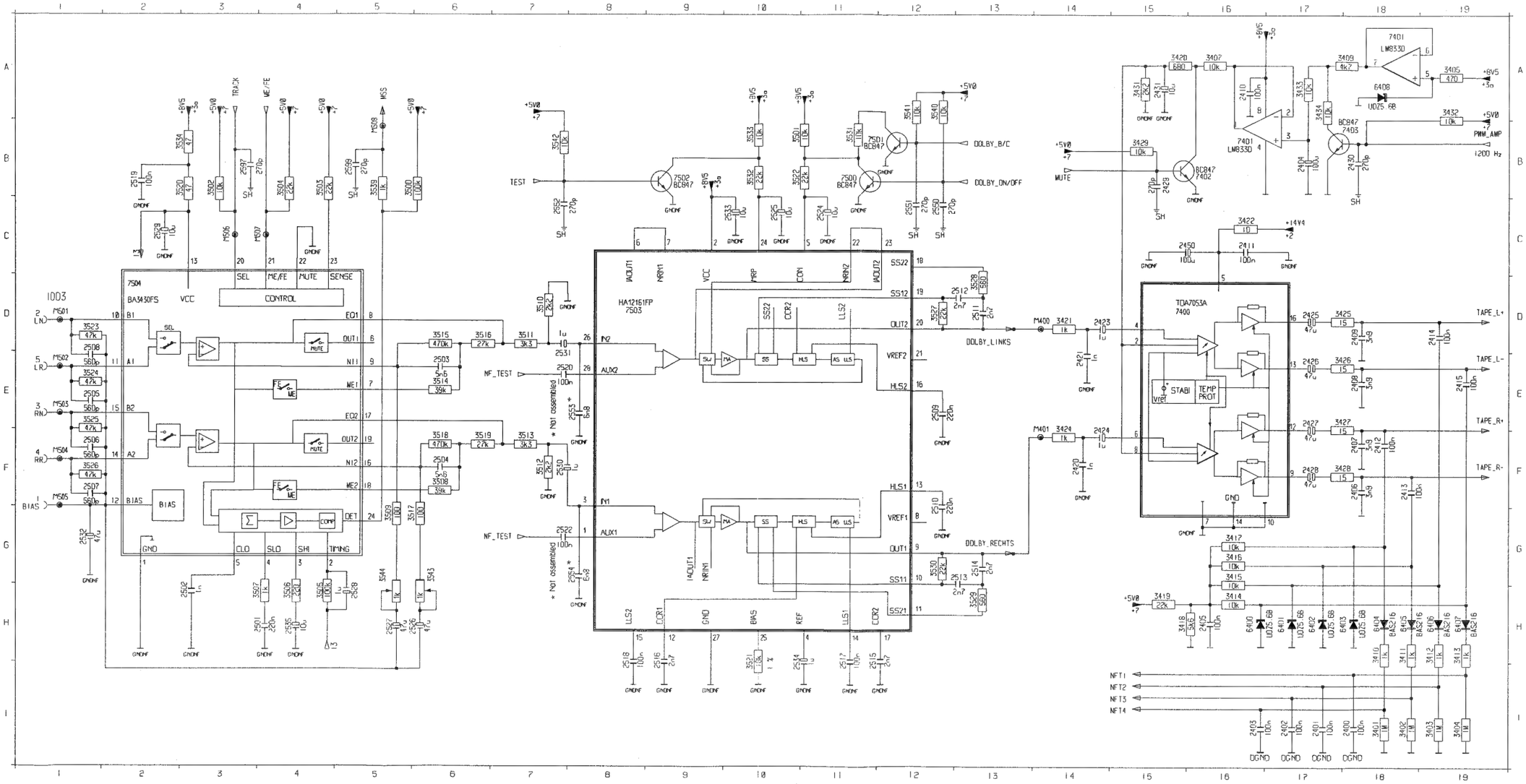



XTAL_SLAVE (IC Pos.7602, Pin 52) Tact frequency (16.5888 MHz) for main- and slave-CPU (DC ≈ 1.4 V)
RESET_SLAVE (M601) Logic reset signal from main CPU after power interruption. High activ.

# DOLBY / AF

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1003 | D 1 | 2409 | D18 | 2424 | F14 | 2502 | H 3 | 2512 | D13 | 2524 | C11 | 2534 | H10 | 3402 | I18 | 3414 | H16 | 3425 | D18 | 3501 | B10 |
| 2400 | I18 | 2410 | A16 | 2425 | D17 | 2503 | E 6 | 2513 | G13 | 2525 | C10 | 2535 | H 4 | 3403 | I19 | 3415 | G16 | 3426 | E18 | 3502 | B 3 |
| 2401 | I17 | 2411 | C16 | 2426 | E17 | 2504 | F 6 | 2514 | G13 | 2526 | H 6 | 2550 | C12 | 3404 | I19 | 3416 | G16 | 3427 | E18 | 3503 | B 4 |
| 2402 | I17 | 2412 | F18 | 2427 | E17 | 2505 | E 1 | 2515 | H11 | 2527 | H 5 | 2551 | C12 | 3405 | A19 | 3417 | G16 | 3428 | F18 | 3504 | B 4 |
| 2403 | I16 | 2413 | F18 | 2428 | F17 | 2506 | F 1 | 2516 | H 9 | 2528 | H 5 | 2552 | C 7 | 3407 | A16 | 3418 | H15 | 3429 | B15 | 3505 | H 4 |
| 2404 | B17 | 2414 | D19 | 2429 | B15 | 2507 | F 1 | 2517 | H11 | 2529 | C 2 | 2553 | E 8 | 3409 | A18 | 3419 | H15 | 3431 | A15 | 3506 | H 4 |
| 2405 | H16 | 2415 | E19 | 2430 | B18 | 2508 | D 1 | 2518 | H 8 | 2530 | F 7 | 2554 | G 8 | 3410 | H18 | 3420 | A15 | 3432 | A19 | 3507 | H 4 |
| 2406 | F18 | 2420 | F14 | 2431 | A15 | 2509 | E12 | 2519 | B 2 | 2531 | D 7 | 2597 | B 3 | 3411 | H18 | 3421 | D14 | 3433 | A17 | 3508 | F 6 |
| 2407 | F18 | 2421 | E14 | 2450 | C15 | 2510 | F12 | 2520 | E 7 | 2532 | G 1 | 2599 | B 5 | 3412 | H19 | 3422 | C16 | 3434 | A17 | 3509 | G 5 |
| 2408 | E18 | 2423 | D14 | 2501 | H 4 | 2511 | D13 | 2522 | G 7 | 2533 | C10 | 3401 | I18 | 3413 | H19 | 3424 | F 4 | 3500 | B 5 | 3510 | D 7 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3511 | D 7 | 3521 | H10 | 3531 | B11 | 6400 | H16 | 7401 | B16 | W401 | F14 | | | | | | | | | | |
| 3512 | F 7 | 3522 | B10 | 3532 | B10 | 6401 | H17 | 7401 | A18 | M501 | D 1 | | | | | | | | | | |
| 3513 | F 7 | 3523 | D 1 | 3533 | B10 | 6402 | H17 | 7402 | B16 | M502 | E 1 | | | | | | | | | | |
| 3514 | E 6 | 3524 | E 1 | 3534 | B 3 | 6403 | H18 | 7403 | B18 | M503 | E 1 | | | | | | | | | | |
| 3513 | F 7 | 3525 | E 1 | 3539 | B 5 | 6404 | H18 | 7500 | B11 | M504 | F 1 | | | | | | | | | | |
| 3514 | E 6 | 3526 | F 1 | 3540 | A12 | 6405 | H18 | 7501 | B12 | M505 | F 1 | | | | | | | | | | |
| 3515 | D 6 | 3527 | D12 | 3541 | A12 | 6406 | H19 | 7502 | B 9 | M506 | C 3 | | | | | | | | | | |
| 3516 | G 6 | 3528 | D13 | 3542 | B 7 | 6407 | H19 | 7503 | D 8 | M507 | C 4 | | | | | | | | | | |
| 3517 | G 6 | 3529 | H13 | 3543 | G 6 | 6408 | A18 | 7504 | D 2 | M508 | B 5 | | | | | | | | | | |
| 3518 | G 6 | 3530 | H12 | 3544 | G 5 | 7400 | D15 | M400 | D14 | | | | | | | | | | | | |
| 3519 | G 6 | | | | | | | | | | | | | | | | | | | | |

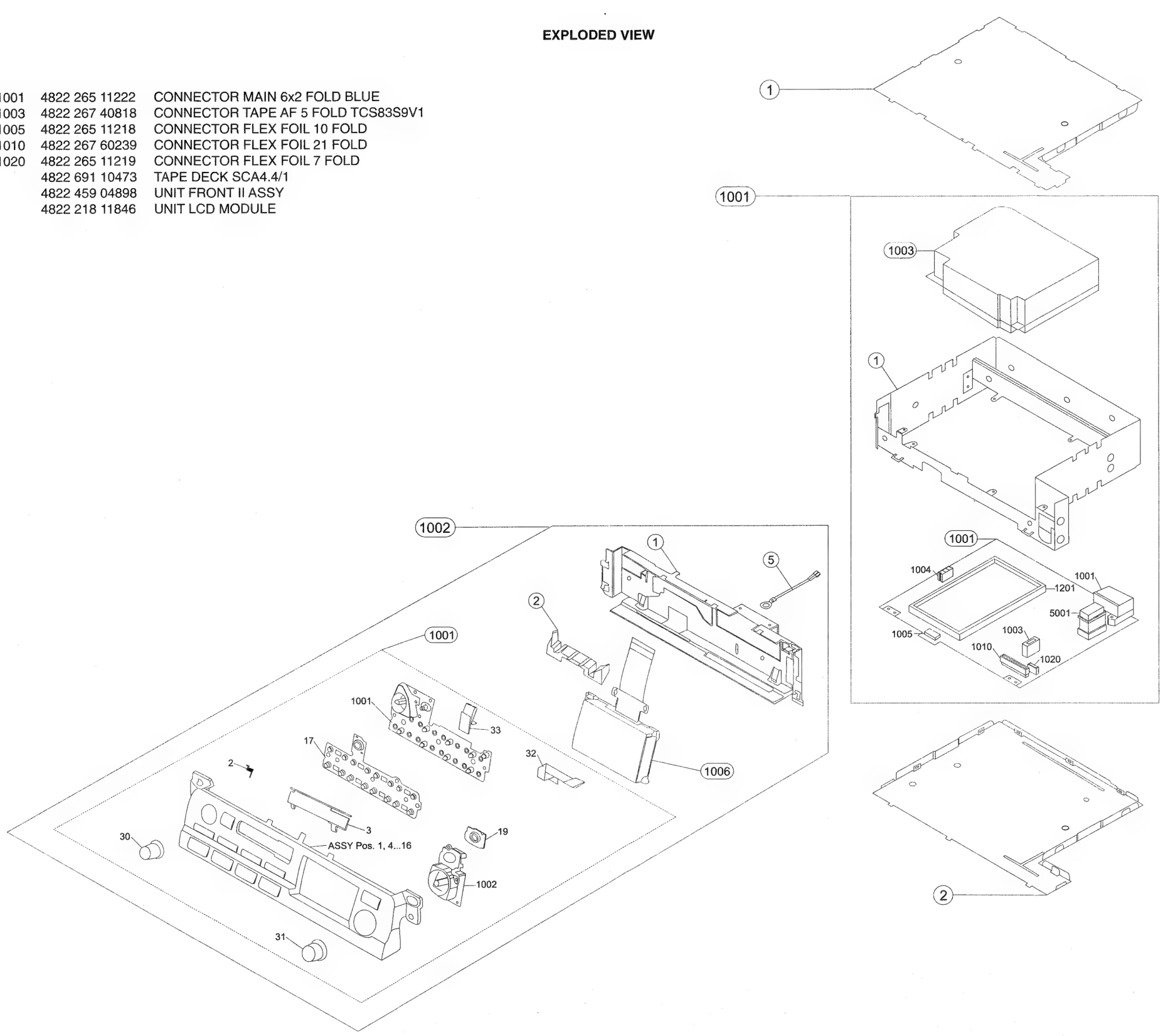



| | | |
|---|---|---|
| NF_TEST* | (IC Pos.7503, Pins 1+28) | PWM reference signal for AF level test |
| DOLBY_LINKS | (M400) | Dolby level left = 300mVeff (test tape 200nWb/m, 400Hz) to be aligned with poti 3544 |
| DOLBY_RECHTS | (M401) | Dolby level right = 300mVeff (test tape 200nWb/m, 400Hz) to be aligned with poti 3543 |
| LN | (M501) | Left channel, NOR direction (3.3 V DC) |
| LR | (M502) | Left channel, REV direction (3.3 V DC) |
| RN | (M503) | Right channel, REV direction (3.3 V DC) |
| RR | (M504) | Right channel, REV direction (3.3 V DC) |
| BIAS | (M505) | Common line of magnetic head (3.3 V DC) |
| TRACK | (M506) | Low = REV. direction, High = NOR. direction |
| ME/FE | (M507) | Low = FE, High = ME |
| MSS | (M508) | Low = NO modulation on tape, High = modulation on tape |
| MUTE | (Trans. Pos.7402, Base) | Preamplifier mute signal. Low (0.0 V) = AF out, High (0.7 V) = AF mutet |
| PWM_AMP | (Trans. Pos.7403, Base) | PWM signal for continuously amplifying control |
| DOLBY_ON/OFF | (Trans. Pos.7500, Base) | Low = DOLBY ON, High = DOLBY OFF |
| DOLBY_B/C | (Trans. Pos.7501, Base) | Low = DOLBY B, High = DOLBY C |
| TEST* | (Trans. Pos.7502, Base) | High (0.7 V) = NF_TEST disabled, Low = NF_TEST enabled (Dolby IC switched to AUX) |

* only for production purposes

## EXPLODED VIEW

| | | |
|---|---|---|
| 1001-1001-1001 | 4822 265 11222 | CONNECTOR MAIN 6x2 FOLD BLUE |
| 1001-1001-1003 | 4822 267 40818 | CONNECTOR TAPE AF 5 FOLD TCS83S9V1 |
| 1001-1001-1005 | 4822 265 11218 | CONNECTOR FLEX FOIL 10 FOLD |
| 1001-1001-1010 | 4822 267 60239 | CONNECTOR FLEX FOIL 21 FOLD |
| 1001-1001-1020 | 4822 265 11219 | CONNECTOR FLEX FOIL 7 FOLD |
| 1001-1003 | 4822 691 10473 | TAPE DECK SCA4.4/1 |
| 1002-1001 | 4822 459 04898 | UNIT FRONT II ASSY |
| 1002-1006 | 4822 218 11846 | UNIT LCD MODULE |



## MISCELLEANEOUS

| | | |
|---|---|---|
| 1001 | 4822 265 11222 | CON. 6x2 FOLD TYPE A BLUE |
| 1003 | 4822 267 40818 | CON. TCS83S9V1 BURNDY |
| 1005 | 4822 265 11218 | CON. BM H 10P F 1.00 |
| 1010 | 4822 267 60239 | CON. 21 PINS |
| 1020 | 4822 265 11219 | CON. BM V 7P F 1.00 |
| 1100 | 4822 252 11302 | FUSE SM T 5A |
| 1200 | 4822 242 10802 | QUARZ 16.588 800 MHZ |

## CAPACITORS

| | | | | | | |
|---|---|---|---|---|---|---|
| 2100 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2101 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2102 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2103 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2104 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2105 | 4822 124 23255 | CAP., ELEC. ALU. | 100UF | | 16V |
| 2106 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2107 | 4822 124 23279 | CAP., ELEC. ALU. | 22UF | 20% | 16V |
| 2108 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2109 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2110 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2111 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2112 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2113 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2114 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2115 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2116 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2117 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2118 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2119 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2120 | 4822 124 23255 | CAP., ELEC. ALU. | 100UF | | 16V |
| 2121 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2198 | 4822 124 80769 | CAP., ELEC. ALU. | 2200UF | 20% | 16V |
| 2199 | 4822 124 80769 | CAP., ELEC. ALU. | 2200UF | 20% | 16V |
| 2200 | 4822 126 13695 | CAP., CER. SMD | 82PF | 1%NP0 | 63V |
| 2202 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2203 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2204 | 4822 126 13851 | CAP., CER. SMD | 68NF | 10% | 16V |
| 2205 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2206 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2207 | 4822 126 13851 | CAP., CER. SMD | 68NF | 10% | 16V |
| 2208 | 4822 126 13693 | CAP., CER. SMD | 56PF | 1%NP0 | 63V |
| 2209 | 4822 126 13689 | CAP., CER. SMD | 18PF | 1%NP0 | 63V |
| 2210 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2211 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2212 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2213 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2214 | 5322 122 31865 | CAP., CER. SMD | 1,5NF | 10%X7R | 63V |
| 2215 | 5322 122 32654 | CAP., CER. SMD | 22NF | 10%X7R | 63V |
| 2216 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2217 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2218 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2219 | 5322 122 32448 | CAP., CER. SMD | 10PF | 5% | 50V |
| 2220 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2223 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2228 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2229 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2302 | 4822 126 13849 | CAP., CER. SMD | 220NF | 10% | 16V |
| 2303 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2304 | 4822 126 13849 | CAP., CER. SMD | 220NF | 10% | 16V |
| 2309 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2310 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2311 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2312 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2313 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2314 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2400 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2401 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2402 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2403 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2404 | 4822 124 80453 | CAP., ELEC. ALU. | 100UF | 20% | 10V |
| 2405 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2406 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2407 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2408 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2409 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2410 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2411 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2412 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2413 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2414 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2415 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2420 | 5322 122 34123 | CAP., CER. SMD | 1NF | 10%X7R | 50V |
| 2421 | 5322 122 34123 | CAP., CER. SMD | 1NF | 10%X7R | 50V |
| 2423 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2424 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2425 | 4822 124 40433 | CAP., ELEC. ALU. | 47UF | 20% | 25V |
| 2426 | 4822 124 40433 | CAP., ELEC. ALU. | 47UF | 20% | 25V |
| 2427 | 4822 124 40433 | CAP., ELEC. ALU. | 47UF | 20% | 25V |
| 2428 | 4822 124 40433 | CAP., ELEC. ALU. | 47UF | 20% | 25V |
| 2429 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2430 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2431 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2450 | 4822 124 11952 | CAP., ELEC. ALU. | 100UF | 20% | 16V |
| 2501 | 4822 126 13849 | CAP., CER. SMD | 220NF | 10% | 16V |
| 2502 | 5322 122 34123 | CAP., CER. SMD | 1NF | 10%X7R | 50V |
| 2503 | 4822 122 32646 | CAP., CER. WIRE | 5,6NF | 10%X7R | 50V |
| 2504 | 4822 122 32646 | CAP., CER. WIRE | 5,6NF | 10%X7R | 50V |
| 2505 | 5322 116 80853 | CAP., CER. SMD | 560PF | 5%NP0 | 63V |
| 2506 | 5322 116 80853 | CAP., CER. SMD | 560PF | 5%NP0 | 63V |
| 2507 | 5322 116 80853 | CAP., CER. SMD | 560PF | 5%NP0 | 63V |
| 2508 | 5322 116 80853 | CAP., CER. SMD | 560PF | 5%NP0 | 63V |
| 2509 | 4822 126 13849 | CAP., CER. SMD | 220NF | 10% | 16V |
| 2510 | 4822 126 13849 | CAP., CER. SMD | 220NF | 10% | 16V |
| 2511 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2512 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2513 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2514 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2515 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2516 | 4822 122 32627 | CAP., CER. WIRE | 2.7NF | 10%X7R | 50V |
| 2517 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2518 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2519 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2520 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2522 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2524 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2525 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2526 | 4822 124 22646 | CAP., ELEC. ALU. | 47UF | 20% | 16V |
| 2527 | 4822 124 22646 | CAP., ELEC. ALU. | 47UF | 20% | 16V |
| 2528 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2529 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2530 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2531 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2532 | 4822 124 22646 | CAP., ELEC. ALU. | 47UF | 20% | 16V |
| 2533 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2534 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2535 | 4822 124 41017 | CAP., ELEC. ALU. | 10UF | | 16V |
| 2550 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2551 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2552 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2597 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2599 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2600 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2601 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2603 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2604 | 4822 126 13851 | CAP., CER. SMD | 68NF | 10% | 16V |
| 2605 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2606 | 4822 126 13851 | CAP., CER. SMD | 68NF | 10% | 16V |
| 2607 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2609 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2610 | 4822 122 32566 | CAP., CER. SMD | 3,9NF | 10%X7R | 63V |
| 2611 | 5322 122 31865 | CAP., CER. SMD | 1,5NF | 10%X7R | 63V |
| 2612 | 5322 122 32531 | CAP., CER. SMD | 100PF | 5%NP0 | 50V |
| 2615 | 5322 122 34098 | CAP., CER. SMD | 10NF | 10%X7R | 63V |
| 2616 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2651 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2652 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2697 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2698 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2699 | 4822 126 13695 | CAP., CER. SMD | 82PF | 1%NP0 | 63V |
| 2700 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2701 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2702 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2703 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2704 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2705 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2800 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2801 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2802 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2803 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2804 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2805 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2806 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2807 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2808 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2809 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2810 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2811 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2812 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2813 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2814 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2815 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2816 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2817 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2818 | 4822 124 23582 | CAP., ELEC. ALU. | 220UF | | 10V |
| 2819 | 4822 126 13196 | CAP., CER. SMD | 100NF | 10%X7R | 25V |
| 2820 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2900 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2901 | 5322 116 80853 | CAP., CER. SMD | 560PF | 5%NP0 | 63V |
| 2902 | 4822 124 23282 | CAP., ELEC. ALU. | 1UF | 20% | 50V |
| 2903 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |
| 2904 | 4822 122 33216 | CAP., CER. SMD | 270PF | 5%NP0 | 50V |

## RESISTORS AND JUMPERS

| | | | | | |
|---|---|---|---|---|---|
| 3100 | 4822 051 20683 | RES., CHIP <20W | 68K00 | 5% | 0.1W |
| 3101 | 4822 051 20153 | RES., CHIP <20W | 15K00 | 5% | 0.1W |
| 3102 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3103 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3104 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3105 | 4822 051 20474 | RES., CHIP <20W | 470K00 | 5% | 0.1W |
| 3106 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3107 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3108 | 4822 051 20008 | RES., CHIP <20W | 0R00 JUMP. (0805) | | |
| 3109 | 4822 051 20104 | RES., CHIP <20W | 100K00 | 5% | 0.1W |
| 3110 | 4822 051 20273 | RES., CHIP <20W | 27K00 | 5% | 0.1W |
| 3111 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3112 | 4822 051 20474 | RES., CHIP <20W | 470K00 | 5% | 0.1W |
| 3113 | 4822 051 20104 | RES., CHIP <20W | 100K00 | 5% | 0.1W |
| 3114 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3115 | 4822 051 20683 | RES., CHIP <20W | 68K00 | 5% | 0.1W |
| 3116 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3117 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3118 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3119 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3120 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3121 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3122 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3123 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3124 | 4822 051 20563 | RES., CHIP <20W | 56K00 | 5% | 0.1W |
| 3125 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3126 | 4822 051 20478 | RES., CHIP <20W | 4R70 | 5% | 0.1W |
| 3127 | 4822 051 20478 | RES., CHIP <20W | 4R70 | 5% | 0.1W |
| 3128 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3129 | 4822 051 20109 | RES., CHIP <20W | 10R00 | 5% | 0.1W |
| 3130 | 4822 051 20472 | RES., CHIP <20W | 4K70 | 5% | 0.1W |
| 3131 | 4822 051 20109 | RES., CHIP <20W | 10R00 | 5% | 0.1W |
| 3200 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3201 | 4822 117 10965 | RES., CHIP <20W | 18K | 1% | 0.1W |
| 3202 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3203 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3204 | 4822 051 20564 | RES., CHIP <20W | 560K00 | 5% | 0.1W |
| 3209 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3210 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3211 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3213 | 4822 117 12955 | RES., CHIP <20W | 2K7 | 5% | 0.1W |
| 3214 | 4822 117 12955 | RES., CHIP <20W | 2K7 | 5% | 0.1W |
| 3217 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3219 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3220 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3221 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3222 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3226 | 4822 051 20472 | RES., CHIP <20W | 4K70 | 5% | 0.1W |
| 3300 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3301 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3302 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3303 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3304 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3307 | 4822 051 20472 | RES., CHIP <20W | 4K70 | 5% | 0.1W |
| 3308 | 4822 051 20472 | RES., CHIP <20W | 4K70 | 5% | 0.1W |
| 3309 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3310 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3311 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3401 | 4822 051 20105 | RES., CHIP <20W | 1M00 | 5% | 0.1W |
| 3402 | 4822 051 20105 | RES., CHIP <20W | 1M00 | 5% | 0.1W |
| 3403 | 4822 051 20105 | RES., CHIP <20W | 1M00 | 5% | 0.1W |
| 3404 | 4822 051 20105 | RES., CHIP <20W | 1M00 | 5% | 0.1W |
| 3405 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3407 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3409 | 4822 051 20472 | RES., CHIP <20W | 4K70 | 5% | 0.1W |
| 3410 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3411 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3412 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3413 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3414 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3415 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3416 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3417 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3418 | 4822 051 20562 | RES., CHIP <20W | 5K60 | 5% | 0.1W |
| 3419 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3420 | 4822 051 20681 | RES., CHIP <20W | 680R00 | 5% | 0.1W |
| 3421 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3422 | 4822 051 20109 | RES., CHIP <20W | 10R00 | 5% | 0.1W |
| 3424 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3425 | 4822 117 12972 | RES., CHIP <20W | 15R0 | 5% | 1W |
| 3426 | 4822 117 12972 | RES., CHIP <20W | 15R0 | 5% | 1W |
| 3427 | 4822 117 12972 | RES., CHIP <20W | 15R0 | 5% | 1W |
| 3428 | 4822 117 12972 | RES., CHIP <20W | 15R0 | 5% | 1W |
| 3429 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3430 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3431 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3432 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3433 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3434 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3500 | 4822 051 20104 | RES., CHIP <20W | 100K00 | 5% | 0.1W |
| 3501 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3502 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3503 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3504 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3505 | 4822 051 20104 | RES., CHIP <20W | 100K00 | 5% | 0.1W |
| 3506 | 4822 117 11503 | RES., CHIP <20W | 220R | 1% | 0.1W |
| 3507 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3508 | 4822 051 20393 | RES., CHIP <20W | 39K00 | 5% | 0.1W |
| 3509 | 4822 051 20101 | RES., CHIP <20W | 100R00 | 5% | 0.1W |
| 3510 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3511 | 4822 051 20332 | RES., CHIP <20W | 3K30 | 5% | 0.1W |
| 3512 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3513 | 4822 051 20332 | RES., CHIP <20W | 3K30 | 5% | 0.1W |
| 3514 | 4822 051 20393 | RES., CHIP <20W | 39K00 | 5% | 0.1W |
| 3515 | 4822 051 20474 | RES., CHIP <20W | 470K00 | 5% | 0.1W |
| 3516 | 4822 051 20273 | RES., CHIP <20W | 27K00 | 5% | 0.1W |
| 3517 | 4822 051 20101 | RES., CHIP <20W | 100R00 | 5% | 0.1W |
| 3518 | 4822 051 20474 | RES., CHIP <20W | 470K00 | 5% | 0.1W |
| 3519 | 4822 051 20273 | RES., CHIP <20W | 27K00 | 5% | 0.1W |
| 3520 | 4822 051 20479 | RES., CHIP <20W | 47R00 | 5% | 0.1W |
| 3521 | 4822 117 10965 | RES., CHIP <20W | 18K | 1% | 0.1W |
| 3522 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3523 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3524 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3525 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3526 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |

| | | | | | |
|---|---|---|---|---|---|
| 3527 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3528 | 4822 051 20561 | RES., CHIP <20W | 560R00 | 5% | 0.1W |
| 3529 | 4822 051 20561 | RES., CHIP <20W | 560R00 | 5% | 0.1W |
| 3530 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3531 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3532 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3533 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3534 | 4822 051 20479 | RES., CHIP <20W | 47R00 | 5% | 0.1W |
| 3539 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3540 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3541 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3542 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3543 | 4822 101 11187 | RES., VAR. <20W | 1K | 30%LIN | 0,1W |
| 3544 | 4822 101 11187 | RES., VAR. <20W | 1K | 30%LIN | 0,1W |
| 3600 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3601 | 4822 117 10965 | RES., CHIP <20W | 18K | 1% | 0.1W |
| 3602 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3603 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3604 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3605 | 4822 051 20109 | RES., CHIP <20W | 10R00 | 5% | 0.1W |
| 3607 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3609 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3610 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3653 | 4822 051 20478 | RES., CHIP <20W | 4R70 | 5% | 0.1W |
| 3699 | 4822 051 20102 | RES., CHIP <20W | 1K00 | 5% | 0.1W |
| 3700 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3701 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3702 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3800 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3801 | 4822 117 10834 | RES., CHIP <20W | 47K | 1% | 0.1W |
| 3802 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3803 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3804 | 4822 051 20228 | RES., CHIP <20W | 2R20 | 5% | 0.1W |
| 3805 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3807 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3808 | 4822 051 20471 | RES., CHIP <20W | 470R00 | 5% | 0.1W |
| 3810 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3811 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3812 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3813 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3814 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3815 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3816 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3817 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3818 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3819 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3820 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3821 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3900 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3901 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3902 | 4822 051 20101 | RES., CHIP <20W | 100R00 | 5% | 0.1W |
| 3903 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3904 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3905 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 3906 | 4822 051 20223 | RES., CHIP <20W | 22K00 | 5% | 0.1W |
| 3908 | 4822 117 11449 | RES., CARBON | 2K2 | 1% | 0.1W |
| 3909 | 4822 117 10833 | RES., CHIP <20W | 10K | 1% | 0.1W |
| 4200 | 4822 051 20008 | RES., CHIP <20W | 0R00 JUMP. (0805) | | |
| 4600 | 4822 051 20008 | RES., CHIP <20W | 0R00 JUMP. (0805) | | |

**COILS**

| | | |
|---|---|---|
| 5100 | 4822 157 71259 | FILTER CU15B2 |
| 5200 | 4822 157 10396 | LQH4N 33U 10% |
| 5201 | 4822 157 71267 | BLM31BG01SPT |
| 5202 | 4822 157 71267 | BLM31BG01SPT |
| 5600 | 4822 157 10396 | LQH4N 33U 10% |
| 5601 | 4822 157 71267 | BLM31BG01SPT |
| 5602 | 4822 157 71267 | BLM31BG01SPT |

**DIODES**

| | | | |
|---|---|---|---|
| 6100 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6101 | 4822 130 11152 | REFERENCE | UDZ18B |
| 6102 | 4822 130 83757 | BAS216 | |
| 6103 | 5322 130 34331 | BAV70 | |
| 6104 | 5322 130 34331 | BAV70 | |
| 6105 | 5322 130 10675 | POWER REC. | MBRS1100 |
| 6106 | 5322 130 34337 | BAV99 | |
| 6108 | 4822 130 83757 | BAS216 | |
| 6110 | 4822 130 10655 | POWER REC. | 1SR154-400 |
| 6113 | 4822 130 10654 | BAT254 | |
| 6200 | 4822 252 60125 | SPARK GAP | DSP-201M-A21F |
| 6202 | 4822 130 10654 | BAT254 | |
| 6203 | 4822 130 10654 | BAT254 | |
| 6301 | 5322 130 34331 | BAV70 | |
| 6400 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6401 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6402 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6403 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6404 | 4822 130 83757 | BAS216 | |
| 6405 | 4822 130 83757 | BAS216 | |
| 6406 | 4822 130 83757 | BAS216 | |
| 6407 | 4822 130 83757 | BAS216 | |
| 6408 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6600 | 4822 252 60125 | SPARK GAP | DSP-201M-A21F |
| 6602 | 4822 130 10654 | BAT254 | |
| 6700 | 4822 130 83757 | BAS216 | |
| 6800 | 5322 130 34331 | BAV70 | |
| 6801 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6900 | 4822 130 10185 | REFERENCE | UDZ5.6B |
| 6901 | 4822 130 83757 | BAS216 | |

**TRANSISTORS AND IC's**

| | | |
|---|---|---|
| 7100 | 4822 209 33883 | TLE4262G |
| 7101 | 4822 209 15979 | VN02NSP |
| 7102 | 4822 130 60511 | BC847B |
| 7103 | 4822 130 60511 | BC847B |
| 7104 | 4822 130 60511 | BC847B |
| 7105 | 5322 130 60508 | BC857B |
| 7106 | 5322 130 60508 | BC857B |
| 7107 | 5322 130 60508 | BC857B |
| 7108 | 5322 130 60508 | BC857B |
| 7109 | 4822 130 60511 | BC847B |
| 7110 | 5322 130 60508 | BC857B |
| 7111 | 4822 209 72227 | L4916 |
| 7112 | 4822 209 15979 | VN02NSP |
| 7200 | 4822 130 60511 | BC847B |
| 7201 | 4822 209 15825 | E100.20B |
| 7202 | 4822 209 15627 | ST24C08M6 |
| 7203 | 4822 209 16194 | P87CE560EFB/144 |
| 7400 | 4822 209 16193 | TDA7053AT |
| 7401 | 4822 209 30095 | LM833D |
| 7402 | 4822 130 60511 | BC847B |
| 7403 | 4822 130 60511 | BC847B |
| 7500 | 4822 130 60511 | BC847B |
| 7501 | 4822 130 60511 | BC847B |
| 7502 | 4822 130 60511 | BC847B |
| 7503 | 4822 209 33636 | HA12161FP |
| 7504 | 4822 209 33884 | BA3430FS |
| 7600 | 4822 130 60511 | BC847B |
| 7601 | 4822 209 15825 | E100.20B |
| 7602 | 4822 209 16195 | P87CE560EFB/145 |
| 7603 | 4822 130 60511 | BC847B |
| 7652 | 5322 209 31276 | SN74HCT573DW |
| 7900 | 4822 130 60511 | BC847B |
| 7901 | 5322 130 60508 | BC857B |
| 7902 | 5322 130 60508 | BC857B |

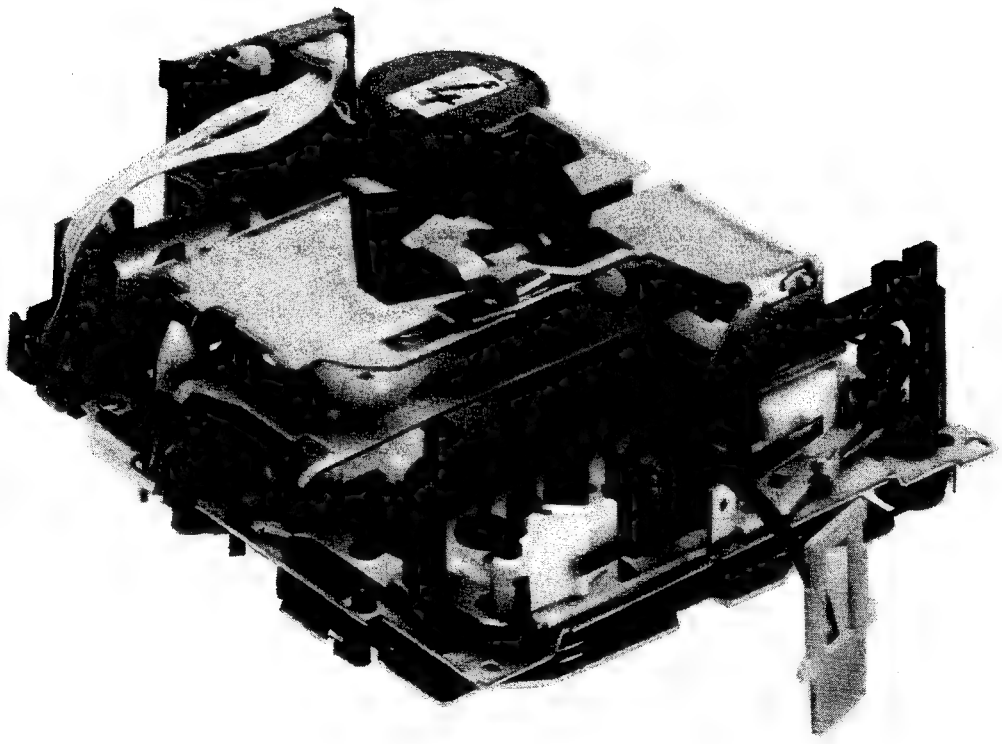
# Car cassette deck SCA

Version 4.4

Service
Service
Service

# Service Manual

12 V



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## MECHANICAL SPECIFICATION

| | |
|---|---|
| Operating positions: | Any position from horizontal to 45° standing vertically on the rear side. |
| Operating temperature: | -20°C to +70°C |
| Tape speed: | 4,76 cm/sec |
| Wow and flutter: | < 0,5% unweighted |
| | < 0,3% weighted |
| Winding time: | |
| Test tape: RCA 118 ( C60 ) | < 110 sec |
| Eject and loading time: | < 2 sec |

## ELECTRICAL SPECIFICATION

| | |
|---|---|
| Voltage: | min 10,6 V max 16,0 V |
| Current - playback: | 200 mA |
| Current - fast wind: | 150 mA |
| Current - eject, standby: | 100 µA |
| Hold in voltage: | 8,0 V |
| Capstan motor: | 14,4 V |
| Servo motor: | 2 V DC Play |
| | 11,5 V DC Fast, Servo |
| Playback Crosstalk | |
| ch. 1 - 2 / 3 - 4 | > 36 dB |
| ch. 2 - 3 | > 46 dB |

## FEATURES

The SCA-4.4 tape deck is usable in several sets. Most of the control functions depend on the hard- and software-configuration of the set in which the deck is installed.
The set µC can control soft eject, emergency eject, standby mode, reverse function, MSS, ME/FE and DOLBY indication.
Some versions of the deck could be equipped with a groved head and/or a preamplifier circuit.

## HANDLING AND DEMOUNTING INSTRUCTIONS

### GENERAL

- Protect the tape deck against ESD !
- Plastic catches and snap connections must be released careful with screwdriver or tweezers.
- Cables must be laid in the defined cable guidings after mounting.
- For lubrication see indications in the exploded view.
- To clean tape transport and head only use moist cleaning tapes or piece of cloth, take care that no fluid (alcohol) drops into the bearing.
- For transport lift/carrier assy must be in eject position, do not carry the deck by touching the lift/carrier.
- Use a screwdriver 2,5 mm with insulated shaft for adjusting drift.
- Screw the deck into the set in order: Front right, front left, rear left, rear right.

DEMOUNTING

1. Carrier/lift (44)
1.1 Lift in eject position - put leg of eject spring (12) into mounting position acc. fig. 8 and fig. 2 - J
1.2 Lift in play position - unclamp cassette holder (49) from eject lever (48) with a left-upwards motion acc. fig.1-B
1.3 Lift in eject position - push plastic hook (fig.1-D) and pull out eject lever, remember position of ejector spring (55) and switching pin (54) for re-assembly later on
1.4 Release fixation lever (fig.1-F) by clicking out in left direction and then turn to the right
1.5 Lift in mid position - take out carrier and lift by releasing plastic hooks at the left (fig.1-G)

2. Head support
2.1 Take out carrier/lift according 1.
2.2 Remove head carrier spring (37)
2.3 Turn head support fixation lever acc. fig.3-A
2.4 Position pin of switching lever (20) to max. left point, see fig.3-detail I
2.5 Release plastic snapper (fig.3-H) and take out head support assembly
!!! TAKE CARE NOT TO BENT THE HEAD CARRIER !!!
2.6 Press plastic fixation (fig.3-detail E,F) and take out magnetic head
2.7 Push pressure spring (27) acc. fig.3-D and move it out
2.8 Release plastic hooks (fig.3-B,C) to pull pinch rollers (45+68) out
2.9 Take off anchor spring (13), rotate anchor (2) 90°degrees to take it out (fig.4-A,B,C)

3. Capstan motor (32)
Remove belt (30) from driving wheel, desolder connection cables, unscrew the two torx screws at the bottom of chassis and take out capstan motor
!!! TAKE CARE OF CORRECT AND UNTWISTED MOUNTING OF THE BELT !!!

4. Servo motor (14)
Desolder connection cables and lever up motor out of its clamps (fig.2-F,G)

5. Clutch assy (57-59)
5.1 Remove servo motor acc. 4.
5.2 Cut disk (65) and remove it (must be renewed)
5.3 Pull clutch from the axle (fig.2-H,I)

6. Anchor holder (8) and magnet double (1)
6.1 Desolder cables of magnet
6.2 Swivel anchor holder counter-clockwise and press it off applying force near the pivoting point
6.3 Release plastic clamps of magnet holder and press magnet out from top of the chassis (fig.4-E)

7. Driving belt (30), flywheels (23) and bearings (70)
7.1 Release pivot plate (35) by turning the plastic hooks acc.fig.5-A,B
7.2 Remove pivot plate and driving belt
7.3 Pull out flywheels
7.4 Press bearings out of plastic housings from top side of chassis plate, use a plastic tool with diameter 4mm in order not to damage the housings
7.5 After mounting new flywheels, bearings or pivot plate you have to test wow and flutter because every deck is adjusted individual for these components. If the values of wow and flutter are out of specification, you have to exchange complete deck !
7.6 Degrease capstan axis after re-mounting the flywheels

8. Connection wheel (5), take up wheels (6), backtension springs (69)
8.1 Take out carrier/lift acc. 1.
8.2 Lever up connection wheel from axle (must be renewed)
8.3 Cut disks (65) and remove them (must be renewed)
8.4 Unclamp and pull up wheels with puller (fig.2-A,B)
8.5 Take out backtension springs

9. ME/CR Switch (60)
9.1 Desolder connection cables
9.2 Push with a small pin through the hole at the bottom of the chassis, directly under the switch

10. ON/OFF Switch (26)
10.1 Desolder connection cables
10.2 Lever up switch or push with a small pin through the hole at the bottom of the chassis, directly under the switch if servo motor and clutch were removed previously

11. Control pins (16), gear lever (17), play reverse lever (18)
11.1 Remove flywheels acc. 7
11.2 Remove play reverse lever
11.3 Put control pins into mounting position acc. fig.6-D,E
11.4 Take out gear lever
11.5 Pull out control pins

12. Switching lever (20), swivel wheel assembly (7,15,43)
12.1 Release spring (53) from black plastic pin
12.2 Turn switching lever acc. fig.7-A
12.3 Lever up switching lever from axle
12.4 Remove connection wheel acc. 8
12.5 Take out swivel wheel assembly

13. Switching pin (54), transport rod (25), latch (21)
13.1 Remove ON/OFF Switch acc. 10
13.2 Lever up switching pin from axle
13.3 Remove switching lever acc. 12
13.4 Move out transport rod and latch

## TOOLS REQUIRED

| | |
|---|---|
| Test cassette SBC 420 | 4822 397 30071 |
| Test cassette SBC 419 | 4822 397 30069 |
| Friction test cassette | 4822 395 30054 |
| Puller for clutch (fig.2) | 4822 395 60039 |

## ADJUSTMENTS

## TORQUE OF REELS (FRICTION)

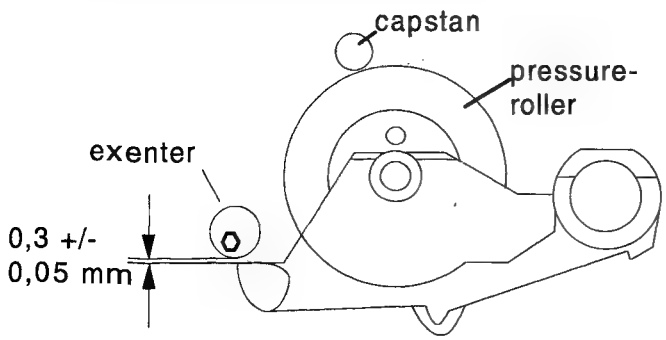
Adjust potmeter pos. 3409 until friction test cassette shows 9,5 +/- 1,5 mNm in NOR direction (after 2 minutes) and 8,5 +/- 1,5 mNm in REV direction. Backtension must be 0,3 to 0,7 mNm.
If values deviate check lubrication, clutch, take up wheels and backtension springs.

## WOW AND FLUTTER, TAPE SPEED

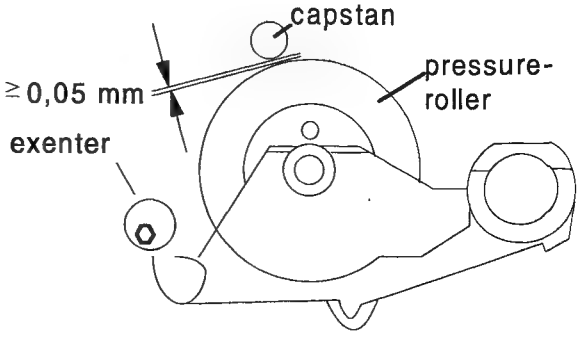
Connect wow and flutter meter to loudspeaker outputs and play the 3150 Hz signal track of test cassette SBC 420. Value should be max. 0,5% (unweighted).
If value deviates check motors, pressure rollers, flywheels, belt, pulley and backtension springs.
Tape speed can be adjusted with motor potentiometer A (see fig.8). Use a screwdriver with insulated shaft !

## PRESSURE ROLLER / CAPSTAN (see figures below)

Adjust clearance play-NOR position between pressure roller and stop head carrier




Adjust clearance FFW position between pressure roller and capstan




SCA-4.4

**EJECTOR 48, HOLDER 49, LIFT 44**

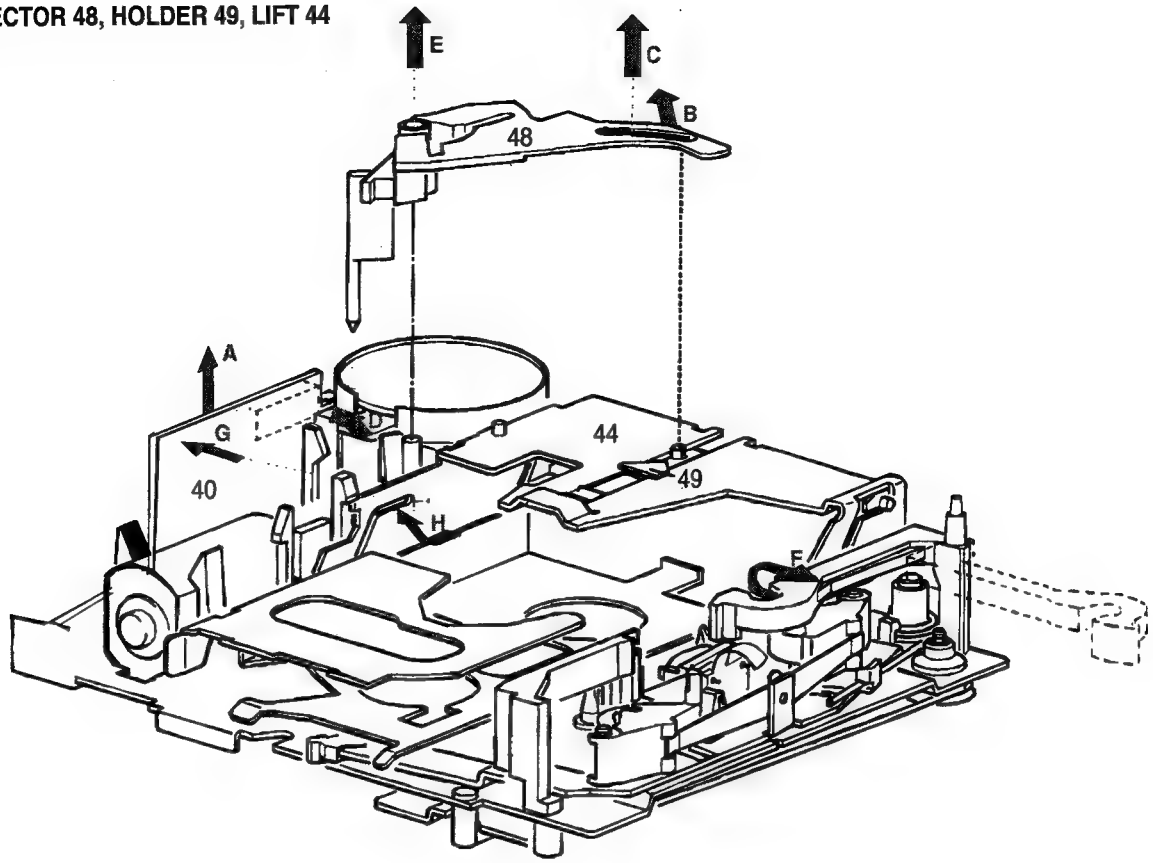



Fig. 1

**CLUTCH 59, SWITCH 60, GEAR WHEEL 5, CARRIER 6**

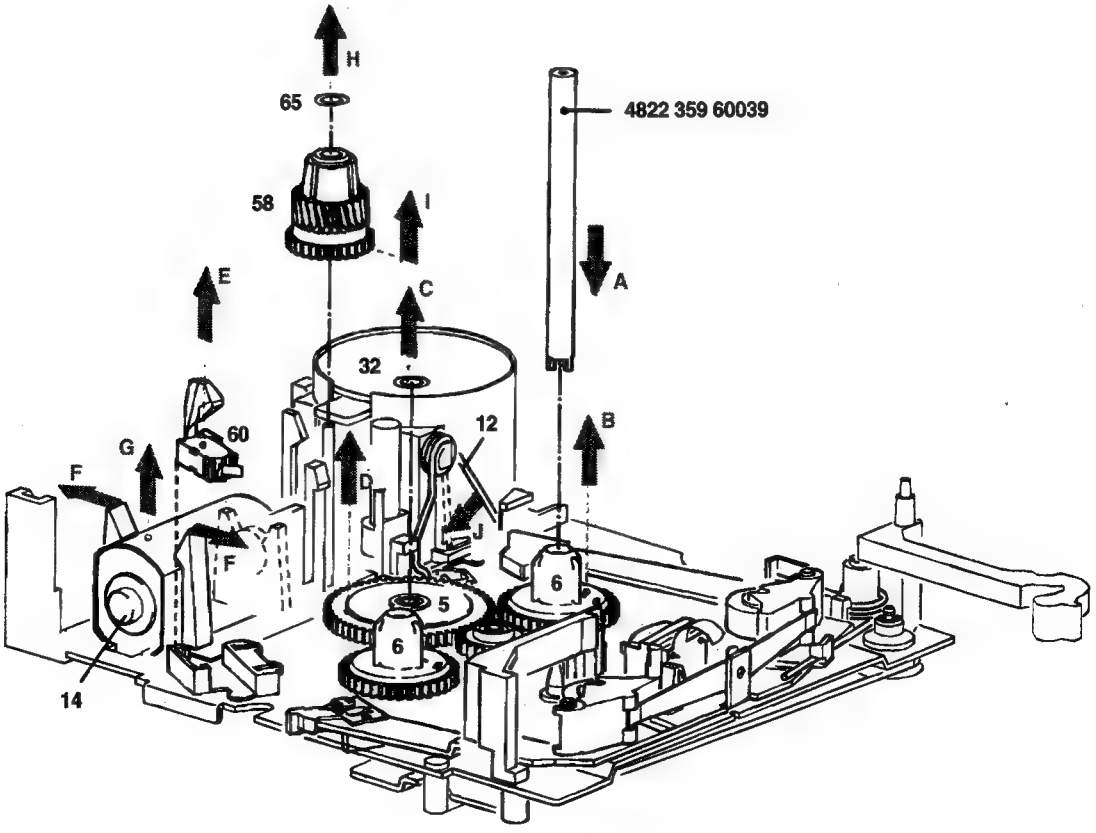



Fig. 2

PRESSURE ROLLER 45, HEAD BRACKET 33, HEAD 34

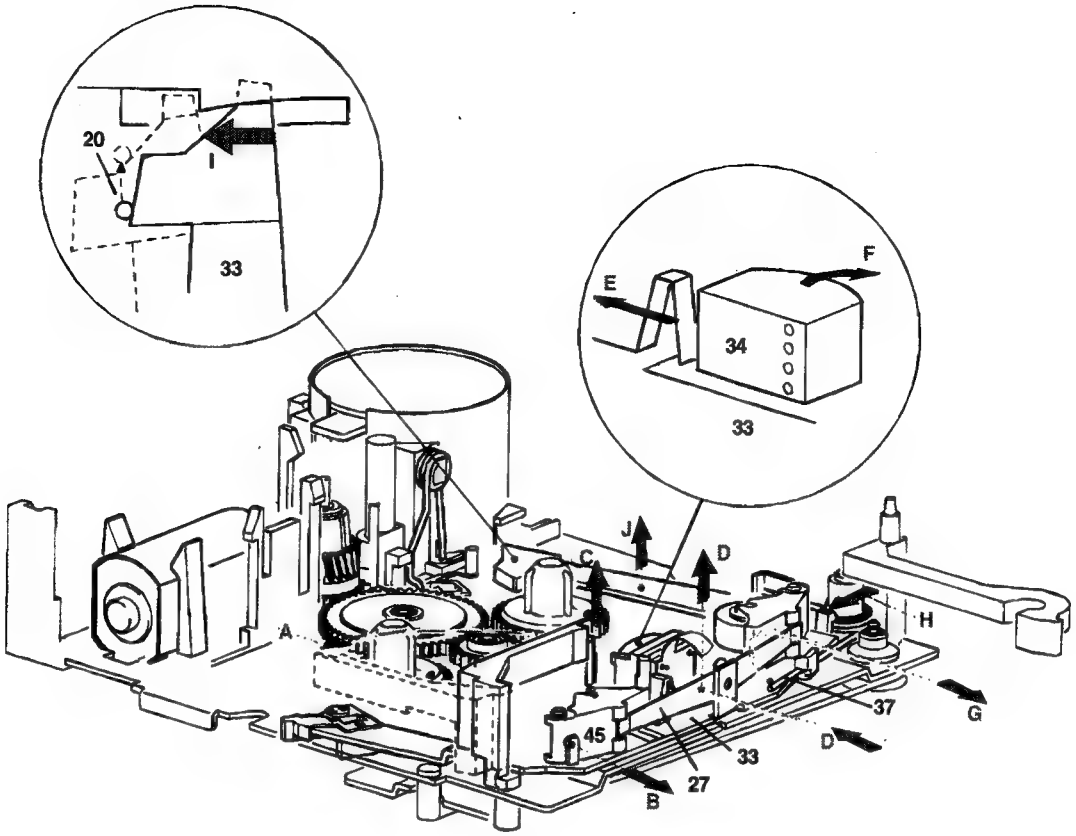



Fig. 3

ANCHOR 3/5, RELAY 1

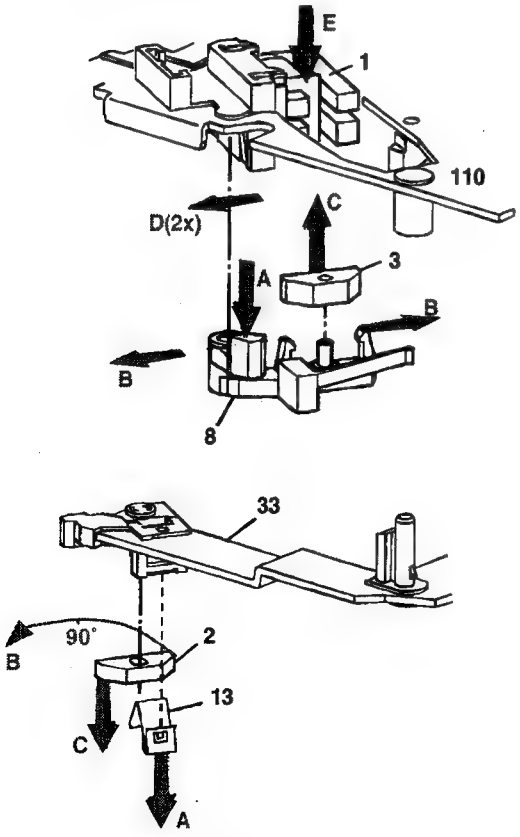



Fig. 4

FLYWHEEL 23, BELT 30

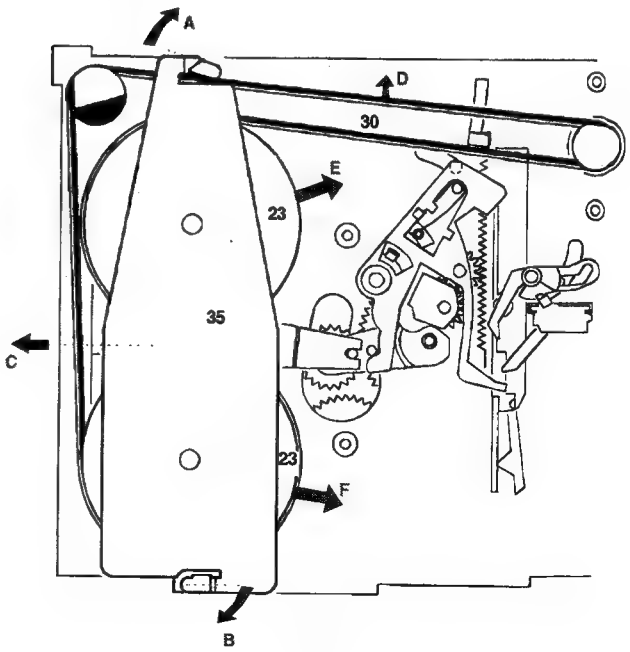



Fig. 5

SEGMENT 16, BRACKET 17, BEARING 70

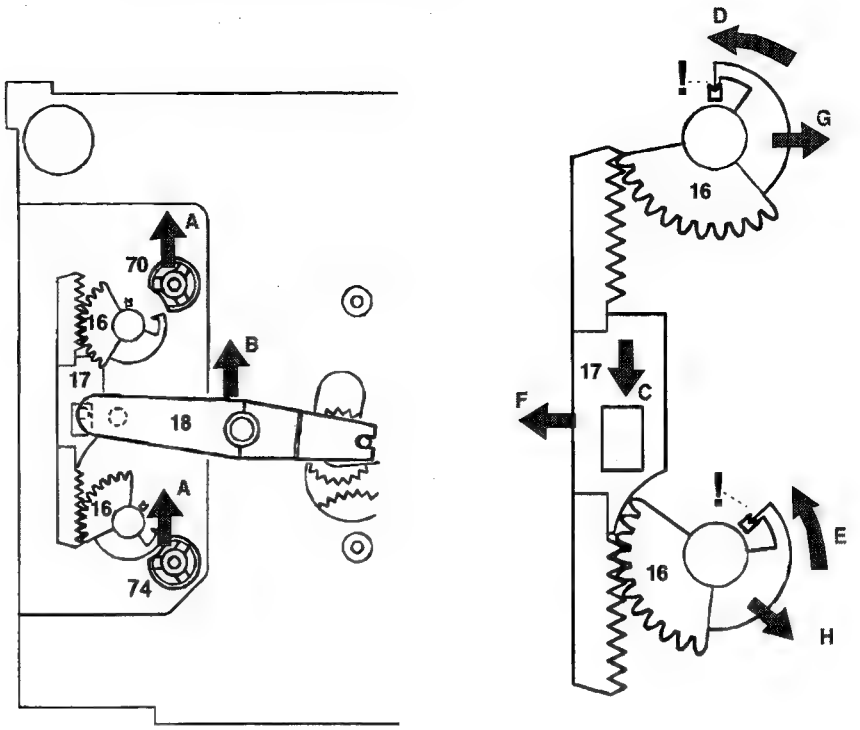



Fig. 6

SWITCH 26, SWIVEL GEAR 7, LEVER 20

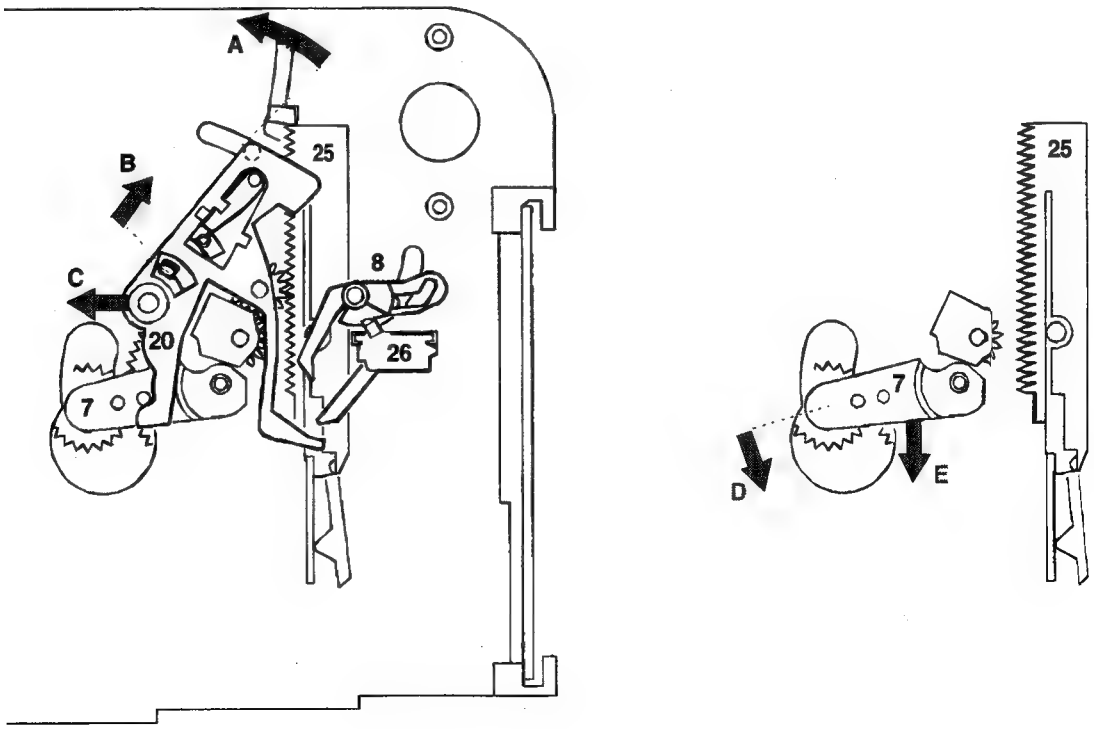



Fig. 7

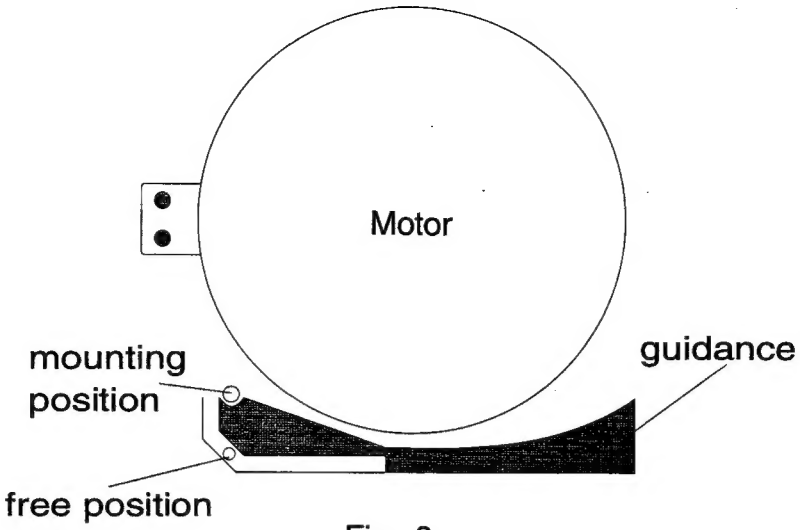
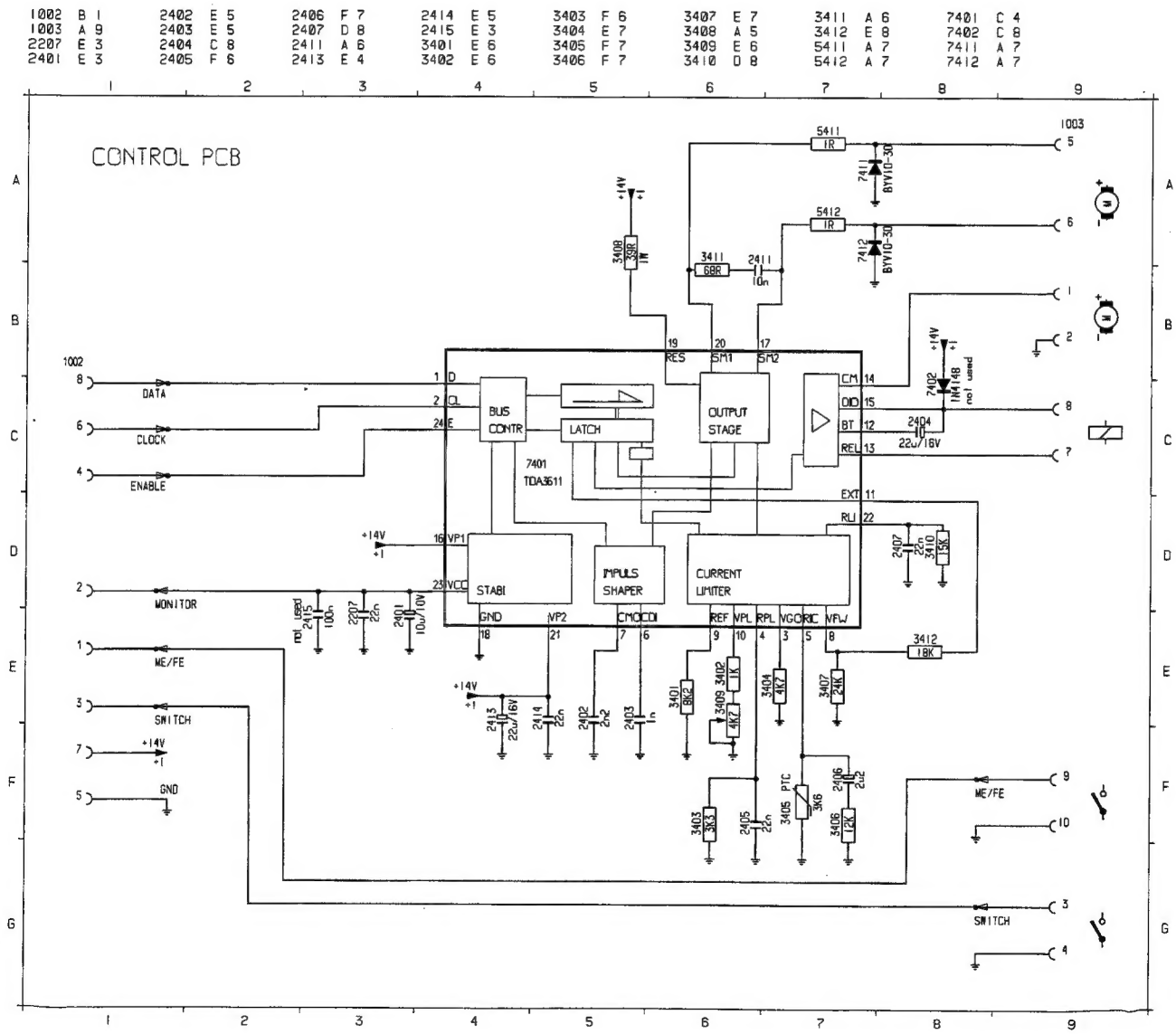

Motor
mounting position
guidance
free position

Fig. 8


1002 B 1
1003 A 9
2207 E 3
2401 E 3
2402 E 5
2403 E 5
2404 C 8
2405 F 6
2406 F 7
2407 D 8
2411 A 6
2413 E 4
2414 E 5
2415 E 3
3401 E 6
3402 E 6
3403 F 6
3404 E 7
3405 F 7
3406 F 7
3407 E 7
3408 A 5
3409 E 6
3410 D 8
3411 A 6
3412 E 8
5411 A 7
5412 A 7
7401 C 4
7402 C 8
7411 A 7
7412 A 7
CONTROL PCB
DATA
CLOCK
ENABLE
MONITOR
ME/FE
SWITCH
GND
BUS CONTR
LATCH
OUTPUT STAGE
7401 TDA3611
STABI
IMPULS SHAPER
CURRENT LIMITER
not used
SWITCH

## MEASUREMENTS ON CONTROL PCB

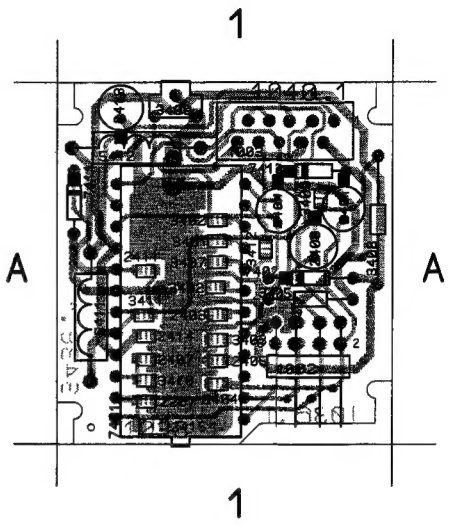
ME/FE: 0,0 V (FE) / 5,0 V (ME/CR)
ON/OFF: 0,0 V (ON) / 5,0 V (OFF)

**Pos. 7401** TDA 3611

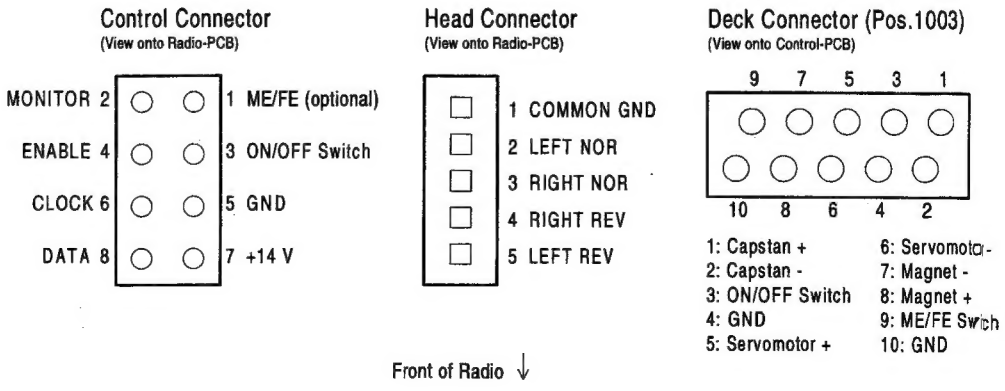
1: 5,0 V
2: 5,0 V
3: 0,7 V / 0,0 V (Sb)
4: 0,8 V (PN) / 0,9 V (PR) / 0,3 V (W) / 0,0 V (Sb)
5: 0,8 V (PN) / 1,0 V (PR) / 0,4 V (W) / 0,0 V (Sb) / 0,1 V (TA)
6: 0,8 V (PN) / 1,0 V (PR) / 0,4 V (W) / 0,0 V (Sb) / 0,1 V (TA)
7: 0,7 V (P) / 1,8 V (W) / 0,0 V (Sb) / 0,6 V (TA)
8: 3,4 V / 0,0 V (Sb)
9: 1,2 V / 0,0 V (Sb)
10: 0,5 V / 0,0 V (Sb)
11: 3,4 V / 0,0 V (Sb)
12: 12,0 V
13: 0,5 V / 12,0 V (Sb)
14: 0,0 V / 11,5 V (P)
15: 11,5 V / 12,0 V (Sb)
16: 12,0 V
17: 0,1 V (PN) / 2,4 V (PR) / 0,0 V (WN) / 12,0 V (WR) / 0,0 V (Sb)
18: GND
19: 12,0 V / 8,5 V (P)
20: 2,4 V (PN) / 0,1 V (PR) / 12,0 V (WN) / 0,0 V (WR) / 0,0 V (Sb)
21: 12,0 V
22: 3,6 V (P) / 1,3 V (W) / 0,0 V (Sb)
23: 5,0 V
24: 5,0 V
**All values measured DC - GND**

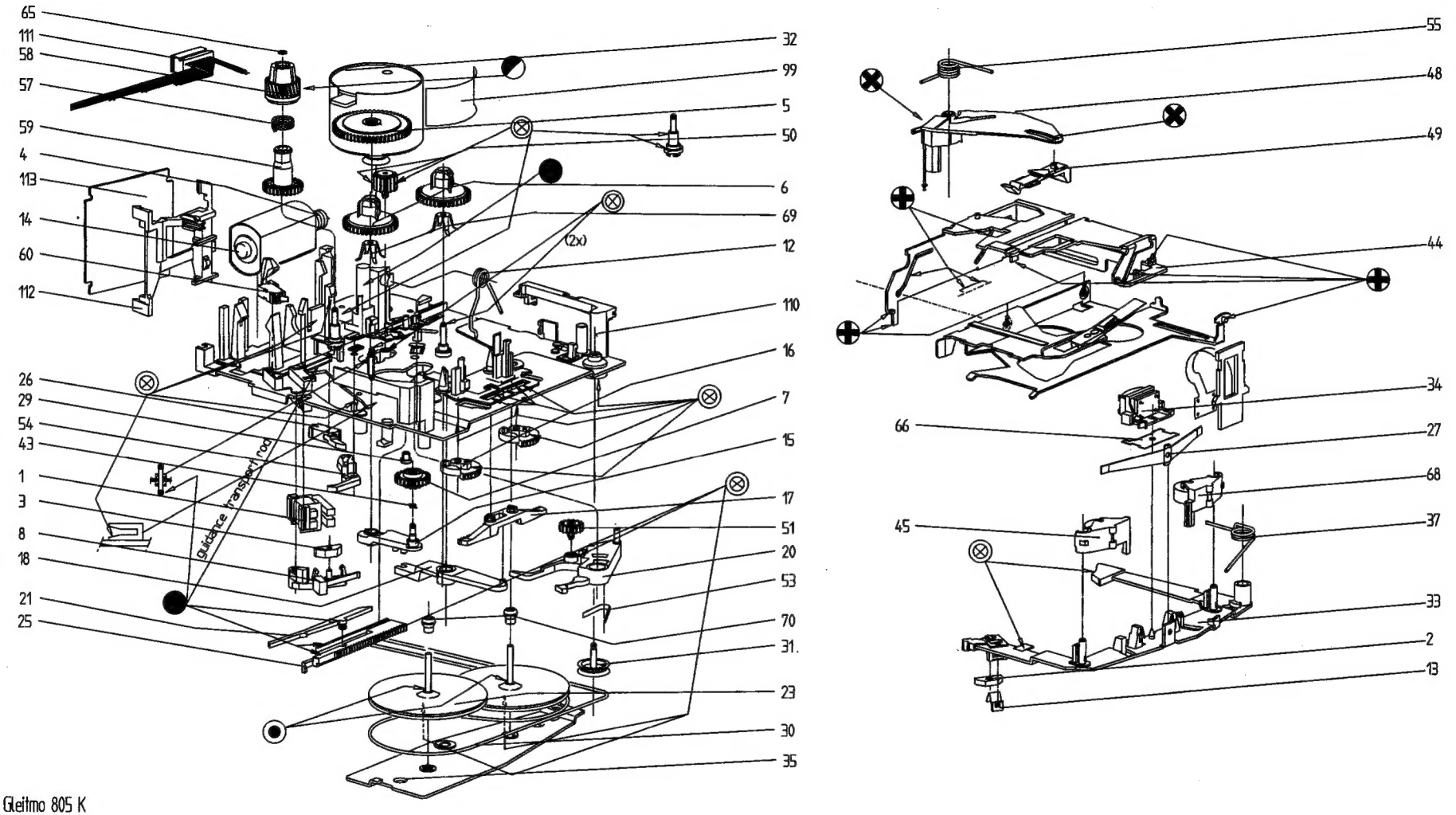
(P) = Play mode both directions
(W) = Wind mode both directions
(PN) = Play NOR direction
(PR) = Play REV direction
(WN) = Wind NOR direction
(WR) = Wind REV direction
(Sb) = Standby
(TA) = Traffic anouncement

1002 A 1 2413 A 1 3409 A 1
1003 A 1 2414 A 1 3410 A 1
2207 A 1 2415 A 1 3411 A 1
2401 A 1 3401 A 1 3412 A 1
2402 A 1 3402 A 1 5411 A 1
2403 A 1 3403 A 1 5412 A 1
2404 A 1 3404 A 1 7401 A 1
2405 A 1 3405 A 1 7402 A 1
2406 A 1 3406 A 1 7411 A 1
2407 A 1 3407 A 1 7412 A 1
2411 A 1 3408 A 1




## CONNECTORS






- Gleitmo 805 K
- Mobil SHC 634
- Contact Oel PDP 65
- Topas L30
- Gleitmo 585 K
- SM30 TF

## MECHANICAL PARTS

| | | |
|---|---|---|
| 1 | 4822 281 11051 | DOUBLE |
| 2 | 4822 404 21083 | ANCHOR ON SUPPORT 33 |
| 3 | 4822 404 21084 | ANCHOR IN HOLDER 8 |
| 5 | 4822 522 32868 | WHEEL IDLER |
| 6 | 4822 528 10776 | CARRIER |
| 7 | 4822 528 70658 | ASSY |
| 8 | 4822 404 21087 | FOR ANCHOR 2 |
| 1 | 4822 492 70556 | FOR ANCHOR 2 |
| 14 | 4822 361 30297 | SERVO ASSY |
| 16 | 4822 522 32869 | NORMAL/REVERSE |
| 17 | 4822 404 21089 | DRIVING 16 |
| 20 | 4822 404 21086 | ASSY SERVO GEARWHEEL |
| 23 | 4822 528 81378 | FLYWHEEL |
| 26 | 4822 277 11215 | ON/OFF |
| 27 | 4822 492 70557 | FOR PRES. ROLLER 45 |
| 29 | 4822 502 12548 | FIX MOTOR 32 |
| 30 | 4822 358 31053 | BELT, DRIVING |
| 31 | 4822 528 81144 | DIVERTING BELT |
| 32 | 4822 361 30294 | CAPSTAN |
| 33 | 4822 404 21088 | FOR HEAD,PRES.ROLLR |
| 34 | 4822 249 30157 | WITH FLEXPRINT |
| 44 | 4822 466 82631 | FOR CASSETTE |
| 45 | 4822 528 81377 | REVERSE |
| 48 | 4822 404 21091 | EJECT |
| 49 | 4822 404 21092 | HOLDING CASSETTE |
| 50 | 4822 522 32871 | COUPLING |
| 59 | 4822 522 10435 | ASSY |
| 60 | 4822 277 11216 | ME/CR |
| 65 | 4822 532 52348 | FOR CARRIER CLUTCH |
| 68 | 4822 528 81449 | NORMAL |
| 69 | 4822 492 70926 | UNDER CARRIER |
| 70 | 4822 520 30539 | FOR FLYWHEEL |
| 111 | 4822 321 61954 | CABLE, CONNECT |
| 112 | 4822 256 92048 | FOR PCB |
| 113 | 4822 214 52077 | PCB KOMPL. |

## ELECTRICAL PARTS

| | | |
|---|---|---|
| 2207 | 5322 122 32654 | 22NF10%X7R 63V |
| 2401 | 4822 124 22748 | 10UF 10V |
| 2402 | 4822 122 33127 | 2,2NF10%X7R 63V |
| 2403 | 4822 122 33178 | 1NF 20% X7R 50V |
| 2404 | 4822 124 23279 | 22UF20% 16V |
| 2405 | 5322 122 32654 | 22NF10%X7R 63V |
| 2406 | 4822 124 41013 | 2,2UF 25V |
| 2407 | 5322 122 32654 | 22NF10%X7R 63V |
| 2411 | 4822 122 33177 | 10NF 20% X7R 50V |
| 2413 | 4822 124 23279 | 22UF20% 16V |
| 2414 | 5322 122 32654 | 22NF10%X7R 63V |
| 3401 | 4822 051 20822 | 8K20 5% 0,1W |
| 3402 | 4822 051 20102 | 1K00 5% 0,1W |
| 3403 | 4822 051 20332 | 3K30 5% 0,1W |
| 3404 | 4822 051 20472 | 4K70 5% 0,1W |
| 3405 | 4822 116 40241 | 3K6 PTC |
| 3406 | 4822 051 20123 | 12K00 5% 0,1W |
| 3407 | 4822 051 20243 | 24K00 5% 0,1W |
| 3408 | 4822 053 10399 | 39R00 5% 1W |
| 3409 | 5322 101 11014 | 5K POTMETER |
| 3410 | 4822 051 20153 | 15K00 5% 0,1W |
| 3411 | 4822 051 20689 | 68R00 5% 0,1W |
| 3412 | 4822 051 20183 | 18K00 5% 0,1W |
| 5411 | 4822 050 21008 | 1R00 1% 0,6W |
| 5412 | 4822 050 21008 | 1R00 1% 0,6W |
| 7401 | 4822 209 32207 | TDA3611 |
| 7411 | 4822 130 32911 | BYV10-30 |
| 7412 | 4822 130 32911 | BYV10-30 |

## AIDS AND TOOLS

| | | |
|---|---|---|
| 100 | 4822 390 10107 | ISOFLEX PDP65 |
| 101 | 4822 390 20128 | TOPAS L30 |
| 103 | 4822 390 10123 | MOBIL OIL SHC 634 |
| 104 | 4822 390 20027 | GLEITMO 805K |
| 105 | 4822 390 20128 | L30 TF |
| 107 | 4822 390 20139 | GLEITMO 585K |